

Money
And the Economic System

MONEY

AND THE

ECONOMIC SYSTEM

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CHAPEL HILL

THE UNIVERSITY OF NORTH CAROLINA PRESS

THE UNIVERSITY OF NORTH CAROLINA PRESS

MANUFACTURED IN THE UNITED STATES OF AMERICA

Preface

THE ACCEPTED BODY of monetary doctrines has undergone great modification in recent years. The principles of money formulated by the older economists are still an important part of our knowledge; but on these principles there has been erected a new superstructure, clarifying, amplifying and extending our understanding of money. Unfortunately, the importance of the newer principles has not yet been recognized by many of our statesmen, with the result that we have persisted in retaining a monetary system entirely inadequate for the complex economic society in which we live.

Particularly, the blind worship of the old gold standard has prevented the development of a monetary system suited to our needs. It has been assumed that gold is a natural and inevitable standard; and that any proposal to replace it must be fallacious and heretical. For many years the gold standard was an end in itself; and the economic system, for better or worse, had to adapt itself to the limitations placed upon it by an antiquated monetary standard.

It is necessary to reconsider the place of money in our economic system. It must be realized that in a society of free enterprise in which production is undertaken for profit, the economic life of the community is to a large extent influenced by money and prices. The fundamental problem of monetary policy is whether this influence is to be exerted thru the haphazard movement of prices in an uncontrolled monetary system, or thru the directed movement of prices in a managed monetary system. The community depends

on money and prices to organize production, to distribute the national income, and to direct the utilization of its income in consumption and production. It is evident that a monetary system based on gold cannot perform these functions satisfactorily. Recent experience indicates that a managed monetary system can perform these functions satisfactorily.

It has been argued that the monetary system is too complex for management, and that under any circumstances our problems are not all of monetary origin. It is true, of course, that we do not know all about money. But that is no reason for neglecting to make use of what we do know. To wait for absolute knowledge is to wait for eternity. The experience of recent years in the United States, in Great Britain and in Sweden is evidence that monetary management is a practicable policy.

It is well to bear in mind the caution that our economic problems are not entirely monetary in nature; and that monetary management is therefore not a universal remedy for economic ills. However, our most pressing economic problem—periodic unemployment—is largely of monetary origin and is subject to monetary control; and there are few economic problems that cannot be more clearly considered once monetary disturbances have been eliminated.

The general reader is advised to make use of the glossary. Also he may omit chapters IX to XII, without interrupting the continuity of the discussions.

I am under great obligations to those who have helped and encouraged me in this and in other work. Particularly, I am indebted to my distinguished teachers, Professor F. W. Taussig, Mr. R. G. Hawtrey and Professor J. A. Schum-

peter; to my colleagues at North Carolina State College, Dean B. F. Brown, and Professors G. W. Forster, R. O. Moen and C. B. Shulenberger; to my colleagues at the University of North Carolina, Professors M. S. Heath, C. P. Spruill and J. B. Woosley; and to Professor Elmer Wood of the University of Missouri. Professors R. W. Green and M. C. Leager of North Carolina State College read the manuscript thru several revisions and offered many useful suggestions; Mr. W. A. Myatt and Mr. Paul Porterfield prepared the charts; Mr. James M. Reid of New York and the staff of the University of North Carolina Press, gave editorial assistance; and my good friends Mr. E. C. Delaney and Dr. Robert Wallach were generous in their help and encouragement.

Acknowledgment is made to the following publishers and authors for their kindness in permitting me to quote extracts from their books. The Macmillan Company, New York: A. Marshall, *Principles of Economics; Money, Credit and Commerce; and Official Papers*; F. W. Taussig, *Principles of Economics*; A. C. Pigou, *Industrial Fluctuations*; G. Cassel, *Money and Foreign Exchange after 1914*; I. Fisher, *The Purchasing Power of Money*; F. A. Hayek, *Prices and Production*; J. S. Lawrence, *Stabilization of Prices*; Harcourt, Brace and Company, New York: J. M. Keynes, *A Treatise on Money; A Tract on Monetary Reform*; G. Cassel, *Fundamental Thoughts on Economics*; D. H. Robertson, *Money*; Harper and Brothers, New York: L. D. Edie, *Money, Bank Credit and Prices*; B. Strong, *Interpretations of Federal Reserve Policy*; National Bureau of Economic Research, New York: F. C. Mills, *Behavior of Prices*; W. L. Thorp, *Business Annals*; John Wiley and Sons, New York: G. F. Warren and F. A. Pearson, *Prices*; W. M. Persons, *Forecasting Business Cycles*; Longmans, Green

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E. M. B.

Raleigh, N. C.,
Feb. 18, 1930.

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PART ONE

The Monetary System

Chapter I

Money and the Price System

1. *The Characteristics of Money*

AN outstanding feature of modern economic society is the extent to which its proper functioning is dependent upon money and prices. It is not too much to say that we live in a monetary society in which our economic behavior not only is expressed in terms of money and prices, but is largely determined by money and prices. The production of goods and services, except by government and by social institutions, is organized for the purpose of showing a profit in terms of money. About three-fourths of the people of this country receive their entire income (other than domestic services performed by the family and the uses of durable goods owned by the family) in the first instance in the form of money; and a large part of the income of the other fourth, the farmers, is received in the form of money. Finally, nearly all economic obligations in our society are undertaken in terms of money and are discharged by payment of money. With this almost universal dependence upon money and prices for the proper organization of economic society, a satisfactory monetary system becomes of extreme importance.

The dependence of our society upon money and prices is not an accidental feature of modern economic life. It is difficult to conceive a complex economic society without money of some kind. The representative business organiza-

tion—a corporation working with large capital, employing many people, producing and transporting goods in many parts of the country—could no more function without money of some kind than could physical science without weights and measures. Money is essential for the proper production, distribution and utilization of the income of a diverse, specialized economic society.

Money is a device for keeping economic accounts, and the monetary unit is the economic unit of measurement.¹ Value is the fundamental economic characteristic, and money is therefore used to measure economic value. Value measured in money is called a price. This characteristic of money—its use as the economic unit of measurement—is of primary importance in the management of business. Every business man tests the efficiency (to him, the profitableness) of his business by reference to accounts he keeps in terms of money. Every contract he makes, for the purchase of goods, for the hire of labor, for the loan of capital and for the rent of land, is expressed in terms of the economic unit of measurement. In the utilization of income, society finds it most economical to apportion consumption and investment by reference to money and prices, and to decide what forms consumption and investment should take by the same means. In all, it seems quite certain that complex economic life requires an economic unit of measurement, and this is no less true of a socialist society than of a society of free enterprise. Wherever economic accounts must be kept, money must be used.²

¹ This characteristic of money is frequently spoken of as the function of money to act as the common denominator of value, the standard of value, the measure of value, the unit of account, or the standard of deferred payments.

² A. Marshall held that a complex economic society is possible with-

Another characteristic of money is that it is a means of keeping command over the real resources—the economic goods and services—it measures.³ Because of this characteristic of money, people are willing to accept payment for goods and services in the form of money, instead of requiring other goods and services. That is, exchange is carried on by purchase and sale rather than by barter. In managing a business, and in ordinary life, it would obviously be difficult to dispense with some device of this kind. Because money gives command over real resources, people find it convenient to keep on hand or at call a stock of money sufficient to meet the need for the real resources they require during an interval of time. This second characteristic of money, its command over real resources, was probably evolved before its use as an economic unit of measurement.⁴

There is a third characteristic of money that has been receiving increasing attention from monetary theorists, its capacity to discharge a debt.⁵ This characteristic of money is

out money, for he wrote: "In fact a world can be conceived in which there is a science of economics very much like our own, but in it there is no money of any sort." *Principles of Economics*, p. 22 n. It is conceivable that in a complex society there need not be a transferable money; but accounts would have to be kept in terms of an economic unit of measurement, and this abstract unit of account would be money.

³ This characteristic is frequently spoken of as the function of money to act as a medium of exchange, and as a store of value.

⁴ Karl Menger held that the origin of money lay in its high degree of saleableness, that is, the ease with which it commanded real resources. "On the Origin of Money," *Economic Journal*, 1892, pp. 239-255. Cf. Adam Smith, *The Wealth of Nations*, Bk. I, chap. IV.

⁵ Hawtrey finds this approach very useful. He regards economic transactions as giving rise to debts. "A unit for the measurement of debts is indispensable." This need not be a physical unit; but there must be a "money of account." R. G. Hawtrey, *Currency and Credit* (1927), p. 2. Cf. n. 2, above. On the relation between the characteristics of money to command real resources and to discharge debts, see H. J. Davenport, *The Economics of Enterprise*, p. 246.

extremely important, for the organization of production in our society is invariably associated with the creation of debts—legal obligations to pay money. A corporation, for instance, undertakes to pay interest or dividends to those who supply the capital for production, to pay other businesses that supply the materials of production, and to pay wages and salaries to the workers who perform the various services essential for the completion of the product. And the corporation will itself have claims upon others to whom it made advances either in money or goods; and these claims can be discharged only by the payment of money.

Every economic transaction may be considered as giving rise to obligations, quite often expressed in terms of money, but whether or not expressed in terms of money, generally dischargeable by payment of money. Even obligations to perform services or to supply goods may be converted into an obligation to pay money. The remedy for a breach of contract is seldom specific performance, for courts commonly convert the obligation into a monetary payment in compensation for the damage suffered from the breach of contract. This characteristic of money to discharge legal obligations is frequently spoken of as its legal tender quality. There have been times when business men have found it extremely difficult to secure the means of paying debts—legal tender money—and at such times the strain upon the economic system has given rise to monetary crises.

A sound monetary system is essential for the effective functioning of economic society. It is difficult to define adequately at this point a satisfactory monetary unit, but it may be tentatively assumed that "the functions of money can be efficiently discharged only when its general purchas-

ing power is secured against violent changes." ⁶ When a monetary unit—the dollar, the pound, the franc or the mark—shows large variations in the quantity of real resources it commands, the monetary system breaks down, and the economic life of the community is seriously retarded. For a complex economic society to function efficiently requires some economic unit of measurement; it requires some means of distributing its annual real income among the co-operating factors of production; and it requires some means of discharging the debts that are necessarily incurred in business transactions.

During the period of the rapid fall in the value of the mark (1923), it completely lost its characteristic as an economic unit of measurement. Business men kept accounts in a non-existent unit, the gold mark, or in a foreign unit, the American dollar or the Swiss franc. Prices were often quoted in foreign monetary units and converted into marks at current rates of exchange. When the monetary unit of the country no longer served as a satisfactory economic unit of measurement, a more precise altho less convenient unit was substituted. As the power of the mark to command real resources declined rapidly, people tended to diminish their normal holdings of purchasing power, and sought to hold real resources directly, or to hold command over them in the form of foreign money. Instead of keeping a quantity of money on hand, a family kept a stock of the goods it actually wanted—the food, clothing and other things it would normally purchase with money. Provision for services, of course, could not be made conveniently in this way. With

⁶ A. Marshall, *Money, Credit and Commerce* (1923), p. 15. The question of a satisfactory monetary unit is discussed at length, chap. XVIII, below, and briefly, chap. I, section 4, below.

8. The Monetary System

rapidly rising prices, business men were less willing to accept rights in the form of marks, so that contracts were frequently expressed in terms of foreign money or in terms of commodities, such as gold, rye, sugar, coal, potash, and lumber. The mark could no longer be used to meet such obligations, for these obligations were not incurred in terms of marks.⁷

2. *The Functions of Money*

These characteristics of money and the nature of our economic society have necessarily resulted in the use of money to regulate the production, the distribution, and the utilization of the national income. Money performs these functions thru the price system—the guidance of economic behavior by reference to prices. In a society of free enterprise some means must be found to determine the volume of production, the apportionment of the productive resources among the various industries, the management of these resources by business men, the distribution of the real income among the coöperating factors of production, and the utilization of this income in consumption and investment. In our society the regulation of the production, distribution, and utilization of the national income is the function of the monetary system. The welfare of the community depends upon the proper performance of this function, and is therefore closely related to the working of the monetary system.

Production in our society being undertaken for profit, the volume of production and the employment of the factors of production depend upon the profits received by business men. If profits are high, there is a tendency for business men to increase their demand for the factors of production. It

⁷ Cf. K. Helfferich, *Money*, pp. 509-511; and H. P. Willis and B. H. Beckhart, *Foreign Banking Systems*, pp. 638-640, 656.

must be noted, however, that when employment is at a maximum, there is no advantage to society in having the profits of business men so high that they are prepared to offer additional employment. Conversely, if profits are low, there is a tendency for business men to decrease their demand for the factors of production. Society can have no interest in maintaining profits so low that production is not at a maximum, for unemployed resources—factors of production—are a social waste and a source of poverty. The level of profits depends upon two factors: the prices of goods, and the expenses of production. A satisfactory monetary system must maintain a proper balance between prices and expenses, so that the volume of production and the employment of the factors of production are at the optimum level.

The monetary system regulates not only the volume produced, but also the kinds of goods and services produced. There are in any society alternative uses to which the productive resources of the community can be put; and in modern economic society, where the goods and services produced are large in number and variety, these alternative uses are exceedingly numerous. Under free enterprise there is no direct control of the apportionment of these resources among the various industries. Business men are permitted to utilize these resources in the production of such goods and services as they choose. The apportionment of these resources among the various industries is nevertheless not fortuitous or arbitrary, for business men are primarily interested in securing a profit from production. Profit is dependent upon the price secured for the good or service sold, and the expense incurred for the resources used. Business men are thus induced to expand the production of high price goods and to economize the use of high price resources.

A rise in the relative price of a good is an indication that the welfare of the community can probably be increased by diverting resources from other industries to the production of the good that has risen in relative price. The rise in relative price, if the relative cost of productive resources does not change, increases the profits of business men producing that good, and they respond by extending their efforts and their uses of resources in the production of that good. There is thus a diversion of resources from other industries to that for which the community's demand has increased. Conversely, a fall in the relative price of a good decreases profits, restricts the activities of business men and their uses of productive resources in that industry, and ultimately leads to a diversion of these resources to other industries.

Somewhat related to the regulation of production is the management of business. Under a system of free enterprise anyone who can secure the means may undertake to direct production—acquire the coöperation of other factors and produce and market the joint product. In general, the representative business man is confronted by a prevailing price for the resources he uses and for the goods he sells; and over these prices the individual producer has no control. His action in coming into or withdrawing from the market has little effect upon prices and expenses, provided other business men do not act in a similar manner. The producer who can utilize his resources to secure profits will continue in business and will have the means, from his own profits and from capital provided by others, to extend his direction of industry. The business man who fails to secure profits will find his means decreasing, the use of the capital of others withdrawn, and his opportunities for continuing to direct production brought to an end.,

The price system is not the only method that could be devised for the regulation of production to assure the expansion of industries whose products are particularly demanded by society, and for concentrating control of production in the hands of business men fitted for the task. In some other economic society another method of regulating production may be found more desirable. It is not argued that the price system leads to the production of goods and services that give the greatest conceivable welfare, but only that the price system is essential to the efficient working of a society of free enterprise. It is generally recognized by economists that the regulation of production by reference to prices and expenses does not lead to the greatest welfare compatible with the existing organization of society. Nevertheless, so long as production is undertaken for profit, the use of money and prices is an aid to the efficient organization of production.

The second function of money is to aid in the distribution of the annual real income of society among the co-operating factors of production. The claims of producers of all kinds upon this annual dividend are satisfied only as they present money income in payment for the real income of goods and services. It is important, therefore, that the proper distribution of money income should occur in the first instance. A defect in the monetary system that tends to divert part of the expected income of the poor to the rich diminishes the total welfare of society. Altho it is equally possible that a defect in the monetary system will divert part of the expected income of the rich to the poor, the chance for gain does not entirely counterbalance the chance for loss. Somewhat related to this aspect of distribution is the possible evil that may result when an expected real income

from a contract is altered by a defect in the monetary system. The effect of this alteration in the real terms of a contract upon social welfare depends upon the direction in which real income is diverted, and upon the effect of this diversion on the productive activity of society.

A transfer of real income in such a way as to nullify the expected effect of a contract may have a repercussionary influence on the volume of production. If the defect in the monetary system is such as to deprive business men of the normal profits they expect as remuneration for their services, they will tend to restrict their activities and their uses of the coöperating factors of production, with the result that the national income will be diminished. It is sometimes argued that if the defect in the monetary system is such as to increase the profits of business men, it will have a beneficial repercussionary effect, for business men will then extend their own activities and their uses of productive resources.⁸ To the extent that the increased employment would have been preferred by the coöperating factors of production, altho involving a lower real rate of remuneration, the result is desirable. But if the increased activity is forced upon the coöperating factors of production thru a diminution in their normal real rate of remuneration, and if it deprives the most important factor, labor, of the leisure it would otherwise prefer, the increased activity is undesirable, and the increase in the national income may be accompanied by a decrease in national welfare.

The undesirable repercussionary effects of a change in the value of money may continue for a long time, and may set into motion counteracting forces equally undesirable. The monetary rates of remuneration of the factors of production

⁸ D. H. Robertson, *Money* (1929), pp. 148-151.

are, for a short time, fixed by contract or custom. A change in the value of the monetary unit induces business men to alter their demand for the factors of production at the prevailing rates of remuneration, and leads to an undesirable extension or contraction in the employment of the productive resources of the community. To the extent that expenses are rigid—that is, prices of materials, wage rates, interest rates, rents and taxes—the change in the demand for the factors of production may continue for a long time. It is this rigidity of expenses, combined with variability of prices, that induces, and from the business man's point of view makes necessary, the repercussionary effects on production that follow from an alteration of the real rates of remuneration by a change in the value of money.

The proper utilization of the national income in consumption and investment is of great importance to society. Money and prices are an aid in apportioning current expenditure in such a way as to secure the greatest satisfaction from a given income. For money permits consumers to use their purchasing power in a variety of ways and to use much or little of their income in the purchase of different goods and services, according as they find prices low or high. Even more important, the use of money permits the postponement of purchases until consumers are certain of the manner in which they wish to realize their income. Thus, thru money and prices, consumers are enabled to balance their satisfactions from all goods and services, and to utilize their income in the most efficient manner consistent with their desires.

The use of money is also important as a device for facilitating saving and investment. It is very questionable whether saving would be possible on a large scale in a society in which future consumption could be secured only by the

accumulation of commodities. "A person who in a primitive state of society stores up some things against a future need, may find that after all he does not need those things as much as others which he has not stored up: and there are many future wants against which it is impossible to provide directly by storing up goods. But he who has stored up capital from which he derives a money income can buy what he will to meet his needs as they arise." * Similarly, the use of money facilitates the lending of resources by those who save to those who would make use of these resources in consumption and production. Investment, certainly on the large scale we have, would be impossible in a non-monetary society.

To a large extent, production and consumption, saving and investment, are all determined by the behavior of money, and in turn determine the behavior of money. It is probable that the rate of saving and the rate of investment influence and are influenced by variations in the value of money, and by inducing changes in the employment of the factors of production may affect the magnitude of the national income. It is obvious that a proper equilibrium between present consumption and future consumption will increase the total welfare of society over a period of time. The fundamental functions of money are related to the proper regulation of the production, the distribution and the utilization of the national income. Every characteristic of money, every change in its value, is important primarily because it will effect these functions of money to determine the magnitude and the uses of the national income.

This relationship between the characteristics and functions of money and the magnitude and uses of the national income is a necessary result of the organization of modern economic

* A. Marshall, *Principles of Economics*, p. 227.

society on a basis of free enterprise, in which production is undertaken for profit. Under the circumstances, the community must consider whether it can permit the production, the distribution and the utilization of the national income to be regulated haphazardly by chance movements in the value of money, or whether it will undertake to manage the monetary system to bring about the most desirable production, distribution and utilization of the national income. The unfortunate difficulties that have been experienced from uncontrolled changes in the value of money indicate the necessity of taking some action to prevent, or at least to minimize, these recurrent hardships. That is not to say that management of the monetary system will solve all the economic problems of our society. Clearly our difficulties do not all originate in a defective monetary system, and it is too much to expect monetary management to correct all the evils of our economic society. However, management of the monetary system can largely solve our monetary problems, and it can make easier a consideration and treatment of our other economic problems.

3. *The Money Illusion*

Because money is the economic unit of measurement, and because economic values are expressed in terms of money, there is a widespread tendency to regard the value of money as constant, and to attribute all changes in prices to causes affecting the real supply of or the real demand for goods. Like physical units of measurement, the monetary unit is generally regarded as unchanging, a constant measure of value. "That is precisely where the illusion lies. It has become customary to refer the value of everything to that of money. . . . When the value of money varies, the variation

is attributed by language to the other productions for which it is exchanged.”¹⁰ This money illusion is the source of many economic fallacies and the cause of many economic difficulties.

The custom of making contracts for the remuneration of the factors of production in terms of money, and the money illusion, have given rise to the mistaken view that the monetary rates of remuneration are themselves of fundamental importance. For instance, working men generally fail to see that since money wages must be transformed into goods and services to secure real satisfactions, the level of prices is of equal importance with the amount of money wages in determining their economic condition. It is common for working men to have a mistaken feeling of economic betterment when money wages rise, even tho the rise in money wages may be accompanied by an even greater rise in the prices of goods consumed by them. After a time, it is true, this apparent betterment is recognized as an illusion, and there is agitation for a further rise in money wages to counterbalance the increased cost of living. Few working men realize that in the early period of high prices, or during a period of rising prices, real wages may be in fact decreasing, even when money wages are increasing.

This same illusion is even more enduring in a period of low or falling prices. Most working men fail to see that a decrease in money wages does not necessarily result in a lowering of their economic condition. For this reason, there is tremendous resistance to all reductions in money wages, even when it is certain that the lower level of prices is not a temporary phenomenon. Where trades unions are strongly

¹⁰ F. Bastiat, "What is Money?" in *Essays on Political Economy*, edited by David A. Wells (1877), pp. 210, 211.

organized the resistance to wage reductions may not be overcome for a long time, even when the abnormally high level of wages is accompanied by a large amount of continued unemployment. A situation of this kind is believed by many writers on economic questions to be the basis for the abnormal volume of unemployment that has persisted in England since 1920.

The money illusion is by no means confined to working men. Purchasers of securities bearing a fixed monetary return are similarly led astray by the nominal rate of interest. An absolutely high or low rate of interest is considered good or bad for the lender without regard to changes in the value of money that may be taking place. During a period of rising prices, the nominal rate of interest lags in much the same way as the money rate of wages. Where the contracted rate of interest is 6 per cent, an annual rise in prices of 6 per cent entirely nullifies the interest payment; and a more rapid rise in prices makes the lender a loser in the transaction in terms of goods and services. This situation has occurred quite often. In the period from 1896 to 1920, the rise in prices was at so rapid a rate (particularly from 1915 to 1920) that it is unlikely that any normal rate of interest actually contracted for over this whole period yielded a real interest income.

With a fall in the price level, the situation is reversed. An increase in the value of money has the effect of raising the real rate of interest above the nominal rate provided for in the loan contract. If a one-year loan should be made at 6 per cent, and if the price level should fall by 6 per cent during the year, the real rate of interest would be more than double the nominal rate. This distinction between real and nominal interest is hardly known to most purchasers of securities, and they therefore resist, by not lending, a ten-

dency for the nominal rate of interest to be reduced. In this manner, the money illusion tends to perpetuate interest rates that lead to a condition of disequilibrium in saving and investment, and tends so to disturb the balance between prices and the expenses of production as to cause a decrease in the magnitude of the national income, relative to what it would be at lower interest rates.

It is not remarkable that working men and security holders are subject to the money illusion. Their relation to production is dependent, and they are often ignorant of the changes that take place in the level of prices and in the profitableness of business. But even business men are subject to the money illusion. In a period of rising prices, business profits, real and nominal, rise very rapidly. The money illusion causes business men to exaggerate and overestimate the profits they derive during rising prices. There is therefore a tendency on the part of business men to extend their undertakings, not merely beyond normal, but even beyond that abnormal point which they would choose if they were not subject to the money illusion. And this abnormal extension of their undertakings by business men has unfortunate repercussionary effects on business stability.

An increase in money profits does not represent a proportional increase in real profits when prices are rising, particularly since much of the profit during a period of rising prices is not realized, but is recorded as a revaluation of assets acquired at lower prices. Further, a business man is apt to confuse the windfall he secures during a period of rising prices because he is a debtor, with the profits he secures because he is a business man. The decrease in real payments to creditors will cause the accounts of the business to show abnormally large profits, for the real loss of

the creditors is included in the earnings of the business. An extension of business activity requiring further loans at the prevailing level of prices will not be so profitable if the rise is halted. The business man is apt to overlook this, to imagine that the abnormal profits are due to unusual operating efficiency, and to extend his undertakings beyond the point he would choose if he distinguished his profits due to operation from his windfall gains due to rising prices and the losses of his creditors. Thus, in every period of rising prices the money illusion tends to exaggerate the profits of business men, and to inspire in them a mistaken optimism; and precisely the opposite effects are dominant in a period of falling prices, giving rise to exaggerated errors of pessimism.

It is not to be assumed, of course, that the resistance of working men to a reduction in the money rates of wages, and the extension of business activities by producers during a period of rising prices, is entirely due to the money illusion. Quite often, the resistance to a reduction in the money rate of wages is justifiably grounded on the fear that with a recovery in prices, money rates of wages will not be restored. On the other hand, the resistance of business men to an increase in wages during a period of rising prices is grounded on the fear that with a recession in prices, wages will not be reduced. If this mutual suspicion could be avoided, much of the rigidity that characterizes money rates of wages would pass away. Similarly, the extension of business activities by some producers during a period of rising prices is not entirely due to an error of optimism. Altho they realize the illusory basis for much of the extended activity, such business men must, in self interest, extend their own undertakings to take advantage of the favorable conditions. So long as the money illusion dominates the thinking of many

members of the economic community, the rest of the community is helpless in attempting to offset the errors of the many, except thru joint action.

4. *A Satisfactory Money*

It is altogether likely that a large part of the difficulties of our economic society are due to a defective monetary system. While a good monetary system cannot of itself increase the productivity of society, it can do much to avoid the periodic interruptions in production that are characteristic of modern economic society. The problem of supreme importance in monetary theory and practice is to find a satisfactory money. The question has already been raised in this chapter and it was tentatively assumed that "the functions of money can be efficiently discharged only when its general purchasing power is secured against violent changes." The important point is that society requires money as an aid in carrying out certain functions. The best money is that which best performs the monetary functions: the regulation of the production, distribution, and utilization of the national income.

There is a widespread view, particularly among business men, that only gold can be the basis for a satisfactory monetary system; and that a monetary system utilizing paper money not redeemable on demand in a fixed weight of gold is necessarily unsound. There is no foundation for this view, either in history or in theory. Obviously, there is no natural form of money always and everywhere best suited to perform the functions of money. It may be that at other times, or in other places, gold has been or is the most satisfactory form of money. The evidence is that in our country in our time a monetary system firmly established on gold

was incapable of properly performing the functions of money. For this reason it is necessary to consider whether another monetary system, not based on gold, may not be better suited to regulate the production, the distribution and the utilization of the national income.

It has been suggested by Dr. Hayek that the best money for a community is neutral money—that is, money that permits the same economic organization that would exist in a society in which economic exchanges are made directly, without the intervention of money.¹¹ In a sense, a money of this sort is inconceivable, for there cannot be a complex organization of society without money, and there cannot, therefore be a neutral money in our society. Stated in simpler and more concrete terms, the ideal involved in neutral money seems to be that of a monetary society in which the factors of production are not subject to the money illusion, and in which the real terms of contracts expressed in money are realized in accordance with the expectations of those who make them. However, if the expectations of people differ on the prospective movement of prices, and they are likely to differ, money cannot possibly be neutral in its effect on economic behavior. So widespread is the influence of the monetary system on economic organization, that it enters into every aspect of the economic life of the community. Under the circumstances, neutral money is a laudable, but unattainable ideal.

Among economists the generally accepted view is that a satisfactory money must be stable in value. A detailed criticism of the desirability of money of constant purchasing power must be postponed until the monetary problems of our society have been fully considered. At this stage it

¹¹ F. A. Hayek, *Prices and Production* (1931), p. 28.

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may be noted that if the value of money is maintained constant, there can be no money illusion, for the monetary rates of remuneration are then a precise measure of the real rates of remuneration; and these monetary rates of remuneration are a good indication of the economic well-being of the members of the community. It must be remembered, however, that the rigidity that is characteristic of money rates of remuneration may be objectionable even when the value of money is constant, for the equilibrium rates of remuneration vary with business conditions. Stability in the value of money may not entirely eliminate the periodic fluctuations in the volume of production and in the employment of the factors of production. While money of constant purchasing power is much better money than the world has hitherto had, it may, nevertheless, not be completely satisfactory.

(A satisfactory money must perform properly the functions of money. It must bring about the full employment of the available productive resources of the community. It must supply the goods and services that the community requires in the proper proportions. It must place the management of these resources in the hands of those business men most capable of making efficient use of them under the existing organization of society. It must distribute the national income among the factors of production in accordance with the requirements for economic equilibrium under the prevailing business conditions. And it must apportion the uses of the national income between consumption and investment to provide for the present needs and for the maintenance of the progressive efficiency of the factors of production. The money that performs these functions is a satisfactory money, whether it is of gold or of paper, whether it is of constant or of variable purchasing power.)

Chapter II

Modern Forms of Money

1. *Commodity Money*

ALTHO there are in all countries various forms of money, the characteristics and functions of money are everywhere the same. Money may therefore be regarded as anything that is used as the economic unit of measurement, and that is generally accepted in payment for goods and services, and in discharge of economic obligations. It follows from this that not only must the coins and notes issued by government authority be regarded as money, but also the demand deposits in banks. Altho deposit money is not universally accepted in payment for goods and services and in discharge of economic obligations, it is widely accepted.¹ In fact, deposit money is the most widely used of all forms of money. For

¹ A. Marshall observes the variety of meanings attached to the term money and he concludes that there is "need for elasticity in the use of the term." *Money, Credit and Commerce*, p. 13. Until recent times it was common to define money in a narrow sense to include only coins and notes issued by government, and notes issued by banks. A typical definition of this kind is that F. A. Walker. "Money is that which passes freely from hand to hand, in full payment for goods, in final discharge of indebtedness, being accepted equally without reference to the character or credit of the person tendering it." *Dictionary of Political Economy*, II, 790. This, of course, excludes demand deposits. The tendency today is to use the term money in a broad sense. Some writers distinguish these types of money by use of the terms currency and credit. Under any circumstances it is impossible to write on monetary problems and to disregard the large volume of demand deposits that are used to command the services of the factors of production and to purchase goods. For this reason, demand deposits are here regarded as deposit money.

a full understanding of monetary problems it is important to know how the various forms of money were developed, and how money came to acquire its characteristics.

The first characteristic of money to appear was its power to command real resources. At a later stage, money became important as the economic unit of measurement; and it is only in recent times—since the customary fees and duties of the feudal system expressed in terms of goods and services were converted into money payments—that the use of money to discharge debts has become of great importance. It is not surprising, therefore, that the earliest kinds of money were commodities, real resources, for which there was a wide and sustained demand. These money commodities offered alternative uses, first, and in the earlier stages more important, for consumption as a commodity; second, as a means of acquiring, thru exchange, other commodities. The practice of keeping on hand a supply of a particular commodity for the purpose of commanding real resources must have developed exceedingly slowly, for commodity money was still in its early stages of development during recorded history. It is interesting to note that in the evolution of commodity money, during the transition period from one money commodity to another, there tended to be a period in which prices were measured in the old commodity and payments were made in the new. The use of money to command real resources thus seems always to precede its use as the economic unit of measurement.

The emphasis in early commodity money was on its broad and unchanging foundation of demand, for conditions of supply were exceedingly slow in changing until very recent times. Cattle, the most typical of the primitive forms of money, supplied the meat and dairy products that were an

important part of the food supply; they provided leather, horn and bone that were useful for clothing and tools; and they furnished the only means of transportation on land, other than human beings. In addition, there was no other important form of durable wealth, except land, in which capital could be invested to yield an income; and the limited supply of land in communities of fixed agricultural methods prevented any great increase of investment in the soil. It is therefore likely that a large part of the real income of a community beginning to use cattle as money was in the form of cattle products. There was one additional factor tending to stabilize the value of cattle, and therefore to increase its suitability for money. The supply of cattle that a freeman owned was likely to be so large relative to any changes that might occur due to giving or receiving cattle in payment for other goods, that the use of cattle in payments probably had little effect on its subjective value to an individual.

At different times a large number of commodities has been used as money. In almost all instances, the existence of a broad and unchanging demand has been the foundation for the use of the commodity as money. Edie's classification is helpful in conveying the great variety of commodities used as money at different times and in different societies. His classification is:

- (1). Consumable necessities, such as rice, salt, corn, fish, furs, tobacco, cattle, clothing.
- (2). Capital goods, such as knives, nails, bullets, weapons, metals.
- (3). Articles of ornament and display, such as shells, beads, gold, silver.²

² L. Edie, *Money, Bank Credit and Prices*, p. 8. Cf. W. S. Jevons, *Money and the Mechanism of Exchange*, chap. IV.

Of these various money commodities, the metals, by economic selection came to be used almost universally and exclusively. The history of the precious metals as money goes back far into the past, probably before 3000 B. C. Almost all the metals have been used as money at one time or another, and many are still used as the material of token coins. Eventually, the world came to use gold and silver as the money commodities, altho large copper blocks were still used as standard money in Sweden in 1776. Since the 1870's gold has been used almost exclusively as the money commodity, the use of silver being confined to the Far East, and to a limited extent in western countries. There are a number of qualities that have tended to make the precious metals the most desirable form of commodity money. Jevons has classified these in the order of their importance: utility and value, portability, indestructibility, homogeneity, divisibility, stability of value, cognizability.³ The meaning of these terms is evident, altho the importance of these qualities may well be questioned.

These qualities of the money commodity are primarily concerned with money as a means of commanding real resources; and so long as command over real resources is the only characteristic of money, these qualities are important. Only the sixth of the seven qualities that Jevons lists in the order of their importance—stability of value—is at all related to the characteristic of money to be the economic unit of measurement. In our complex society, some degree of stability of value is of primary importance, just as the use of money as the economic unit of measurement is its primary characteristic. Only to the extent that money is free from

³ W. S. Jevons, *Money and the Mechanism of Exchange*, chap. V. Cf. F. A. Walker, *Money* (1878), pp. 33-36.

violent and fortuitous changes in value can it properly perform its functions—to regulate the production, the distribution and the utilization of the national income. ,

2. Coined Money

‘Metallic commodity money reached its highest form with the invention and the perfection of the art of coinage. Modern standard gold coins, says Marshall, “are in effect gold ingots whose quantity and quality are certified at public expense.”⁴ While coinage is now everywhere a government function, it was long considered a private right. There are many technical difficulties in coining metal, and early coins varied considerably from the standard weight and fineness. It was particularly difficult entirely to eliminate counterfeiting, and the defacing of coins for the purpose of extracting a part of the precious metal. The perfection of methods for raising the device on coins and for placing an inscription or milling about the edge has minimized the opportunities for clipping coins. The decline in the use of gold coin in circulation has diverted the field of illicit profit from false coining to counterfeiting of paper money; and the arts of engraving, printing, and paper making have been used to prevent as well as to perpetrate such fraud.

Nearly all modern countries permit the free coinage of gold; that is, they undertake to convert a given quantity of gold of specified weight and fineness into a coin, on private account as well as on government account. Generally, no charge beyond the necessary expense of assaying and refining is made for converting the bullion into coin. Where a charge equal to the expense of minting is imposed, the charge

⁴ A. Marshall, *Money, Credit and Commerce*, p. 57. Cf. W. S. Jevons, *Money and the Mechanism of Exchange*, chap. VII.

is called *brassage*. It is to be noted that even where no charge is imposed, any delay in delivering gold coin for gold bullion involves a loss to the owner of the bullion of interest for the period between the delivery of the bullion and the return of the coin. A charge in excess of the expense of converting bullion into coin is called *seigniorage*. In earlier days this charge was an important source of revenue to feudal lords; and even in modern times sovereigns have used the coinage of money as a source of profit. Today, few countries impose any *seigniorage* upon the coining of gold, and even a *brassage* charge is uncommon.

The use of a commodity as money tends to divide the supply of the money metal between its uses as a commodity in industry and art, and as money, so that the value of the money commodity to an individual tends to be approximately the same in its alternative uses. The determination of the value of gold, and the apportionment of the supply to its different uses, is in principle the same as that of any commodity for which there is a composite demand. The many special factors involved in the determination of the value of money as such must be postponed for later consideration. While there is a tendency for equality of value of the money metal in its alternative uses as money and as a commodity, there is seldom precise equality, for there is some cost attached to the conversion of bullion into coin and of coin into bullion.

The money metal being first available as bullion, there can be no inducement to convert the commodity into coin unless the value of the coin exceeds its bullion content by the expense of coinage; and so long as bullion is freely minted, a coin cannot exceed in value its bullion content by more than this expense. Where coinage is not free—where the con-

version of bullion into coin is not undertaken on private account—the coin can exceed in value the metal of which it is made by more than the expense of coinage.⁵ On the other hand, the normal value of a coin cannot fall below the value of its bullion content less the expense of melting and marketing the bullion. Under certain unusual conditions, it is conceivable that a coin can be of less value than its bullion content by more than the expense of melting and marketing the bullion. For instance, if the value of a unit of money declines because of the issue of inconvertible paper money, and the melting or exporting of coin is forbidden by law, the coin will tend to have a lower value than its bullion content. It may still be more valuable than a unit of paper money of the same denomination, for there may be a demand for coin for the purpose of meeting obligations specifically payable in coin (altho such obligations are generally not binding under these conditions); for the purpose of holding coin with the expectation of the removal of the provision against melting or exporting; and for the purpose of utilizing the coin as bullion in defiance of the law. The demand for coin for these various purposes will tend to maintain its value in some market above that of an equivalent unit of inconvertible paper money; altho it may be insufficient to raise the value of coin to that of its bullion content.

3. *Representative Money*

The history of commodity money extends from the first appearance of the characteristics of money to the present time. Nevertheless, commodity money is generally con-

⁵ This occurred in Sweden and in other countries during the World War, when the free coinage of gold was suspended because of the great fall in its value. G. Cassel, *Money and Foreign Exchange after 1914*, pp. 79-100.

sidered an unsatisfactory form of money for actual use in business transactions. Three principal objections have been made to the use of commodity money—its inconvenience for large transactions; the great expense of providing an adequate supply; and the instability in its value. The inconvenience of commodity money for large payments has been remedied in part by the substitution of more valuable for less valuable commodities as money, thus concentrating great value in small bulk. For this reason gold has replaced the other metals as the dominant type of commodity money. A second method of avoiding the inconvenience of commodity money is the use of representatives in the form of receipts or orders calling for the transfer on demand of the commodity they represent. These representatives of commodity money have little or no commodity value themselves; but there is for each receipt or order the quantity of the money commodity for which it calls; and the value of these receipts or orders is determined by the value of the quantity of the commodity they represent.

In early times, scraps of fur or hide were used as symbols of the commodity they represented. The tobacco receipts used for money in colonial Virginia were a perfect example of the use of a representative for a money commodity. English merchants accepted these receipts in payment of debts and used the receipts to secure tobacco for export to England. The origin of modern representative money is probably to be found in the Amsterdam and Hamburg bank money, so important in the economic life of the eighteenth century.⁶ To avoid the inconvenience of making and receiving pay-

⁶ C. A. Conant, *History of Modern Banks of Issue*, p. 198 ff. and 287 ff. For an account of the Bank of Amsterdam see C. F. Dunbar, *The Theory and History of Banking*. See also, J. K. Ingram, "Early European Banks," *Dictionary of Political Economy*, I, 104-106.

ments in coin that varied in weight and fineness, the large traders deposited coin or bullion with the Amsterdam and Hamburg banks and received in return negotiable receipts calling for the delivery of silver on demand. For this service a fee was paid, and bank money was generally at a premium in terms of coin or bullion. In modern times, printed notes are used as representative money. In the United States, two types of representative money have been used—gold and silver certificates.

The use of representative commodity money in place of actual commodity money ought not to have any great effect upon the value of a unit of money. The use of gold certificates obviously does not result in a larger supply of money units than would be available if the commodity itself were coined and used as money. While the use of representative money has no effect upon the supply of money units, its superiority in convenience to commodity money may cause an increase in the demand for purchasing power in the form of money, and thus may tend to raise the value of a unit of money. If a person would wish to keep on hand purchasing power in the form of money, when coin is used, sufficient to purchase the real income for a month, the same person might wish to keep on hand, because of its greater convenience, sufficient representative money to purchase the real income for a month and a half. This would tend to raise the value of a unit of money. Barring this possibility, the use of representative money in place of commodity money cannot affect its value.

Altho the use of representative money eliminates the inconvenience of commodity money in large payments, representative money is subject to the same objections already made to commodity money—the great expense of providing

an adequate supply and the instability in its value. For all practical purposes, therefore, representative money may be regarded as a specialized form of commodity money. It should also be noted that the term representative money is used by British writers to denote all money other than commodity money, even money not convertible into a money commodity. Used in this sense, representative money includes what is here considered managed money.

4. *Managed Money*

Altho the value of commodity money and representative money must always be equal to the value of the commodity of which it is made or which it represents, a country can manage to some extent the quantity and value of the commodity money and representative money within its borders. By regulating the international exchange of goods and the international flow of gold, a country can exercise some control over the commodity money and representative money in its monetary system. On the whole, the degree of control that a country can have over its commodity money is greatly limited, partly because the value of the money commodity is similarly subject to some management by other countries and partly because the production of the money commodity is beyond the control of governments. For all practical purposes, commodity money and representative money may be regarded as beyond the control of the monetary authorities of a country on the gold standard. In fact, whatever influence the monetary authorities ordinarily have over the value of commodity money and representative money is most likely to be exerted thru their control of the managed money of the country.

Commodity money and representative money require a

supply of the money metal precisely equal to the quantity of money in use. For a country in need of a large amount of monetary purchasing power, the exclusive use of commodity money and representative money involves a great expense. Partly for this reason many countries have made use of credit money—money that does not require a quantity of the money metal equal to the volume of money in use. Because the quantity and value of credit money is determined to a large extent by the deliberate acts of governments and of commercial banks, this type of money is better classified as managed money. The more important types of managed money are government managed money issued in the form of notes and token coins either by government or by central banks (hereafter referred to as lawful money),⁷ and bank managed money supplied by commercial banks in the form of demand deposits subject to check (hereafter referred to as deposit money). It is obvious, of course, that in this country managed money, particularly deposit money, is by far the largest part of the money supply of the community.

The managed money supplied by government in the form of notes if not convertible into commodity money is some-

⁷ The term lawful money has been in common use for centuries, and in its broadest sense has meant any money current in the community. In the laws of the United States, this term and similar terms such as lawful currency and lawful tender have evidently been used as synonymous with legal tender. Thus various laws indicate that prior to 1933 only gold and silver coin and United States notes were lawful money, and that gold and silver certificates, altho not legal tender, could be counted as part of the lawful money reserves of national banks. National bank notes and Federal Reserve notes, on the other hand, were not lawful money. The Public Resolution of Congress repealing the gold clause, June, 1933, declared all metallic and paper money of the United States, including bank notes, legal tender. Hereafter, the term lawful money is used to signify all money issued by government or by authority granted by government. The coins and notes issued by the government itself are termed government money.

times called fiat money. The issue of notes by government began far back in history, having probably originated in China in the second century B. C. This form of money was not of great importance until the eighteenth century. During the American Revolution, the Continental Congress issued large quantities of paper money to finance the war. The revolutionary French governments in the last decade of the eighteenth century issued two types of government money, the *assignats* and the *mandats*, both of which depreciated in value very rapidly. During the American Civil War, the Federal and the Confederate governments made use of fiat money to finance military operations, the value of the Confederate dollar entirely disappearing, and the Federal dollar falling to about one-third of its former value. The notes issued by the Federal government, the greenbacks, subsequently rose in value. In 1878 they were equal in value to gold coin, and they are now part of the managed money of the country. The most widespread use of fiat money was by the belligerent and successor governments of Europe during and immediately after the World War. In some countries, the value of a unit of money fell to an infinitesimal fraction of what it had been.

In most countries today, paper money is not issued directly by the government. Instead, the management of the lawful money of the country is entrusted to a central bank under the control of the government. Central bank notes must therefore be regarded as a form of government managed money. The bank note was probably developed from the bill of exchange. The first European bank of issue was the Bank of Sweden, founded in 1656; and its first issue of notes was in 1658. With the chartering of the Bank of England in 1694, its famous notes made their first appearance. The

Bank of England is for all practical purposes an agency of the British government, despite the fact that it is a chartered company, electing its own directors and governor. The issue of money by John Law's Mississippi Company was in the form of bank notes; but the French government gave special privileges to the notes in the payment of taxes and even of private debts, so that they may be regarded as an issue of lawful money. Bank notes have been used in all important countries, until the nineteenth century being issued by commercial banks in the ordinary course of their business. The right of issue of paper money has now been limited by law in all countries, and today, the issue of notes is almost exclusively confined to governments and to central banks under government control.

An important example of government managed money is the subsidiary coin of a country. The fractional money of nearly all governments is made of metal, generally an alloy of copper or silver. To prevent any great variation in the supply of fractional money due to non-monetary causes, the commodity value of token coin is kept considerably below its nominal monetary value, so that there is no inducement to convert fractional, token money into the metal commodity. Fractional money is obviously not commodity money, unless it is considered commodity money with high seigniorage. The fact that fractional money is generally convertible into lawful money indicates that it cannot be regarded as an independent type of money; and the limitation of the legal tender characteristic of fractional money is recognition of this fact. Nor can subsidiary coins be considered a type of representative money, for there is no deposit of a commodity equal in value to the nominal value of the money tokens. Marshall defines subsidiary coins as notes

printed on silver, and subsidiary money is best understood as a special type of government managed money. The value of fractional money is maintained at the proportionate part of the money unit by limitation and regulation of the supply, automatic management being secured by the offer to exchange unit money for fractional money, and fractional money for unit money without charge.

Deposit money, created by commercial banks and placed at the disposal of borrowers is the only important form of bank managed money in this country, the supply of national bank notes being for all practical purposes beyond the control of commercial banks. Deposits are book credits for money transferable by written orders called checks. The rise of deposit banking was concurrent with the decline in the note issuing rights of commercial banks in this country. Not until the 1830's in England was it considered feasible to conduct a successful banking business without the issue of notes. Since that time the use of deposit money has increased rapidly in England, and the commercial banks of that country have carried on a successful and profitable banking business without the privilege of issuing notes. The rise of deposit banking occurred somewhat later in the United States and in other English speaking countries. It was hastened somewhat in this country by the restriction on note issues by banks after the establishment of the national banking system. In other countries deposit banking has not yet become very important, altho there has been a growth in the use of deposit money in Germany and France. The management of bank money is partly controlled by government thru its regulation of the banking system. The limitations upon the chartering of banks, upon the making of bank loans, and the requirement of keeping bank reserves, all give government a part in the management of deposit money.

5. *The Objects of Money Management*

Governments and banks have had many objects in the management of money. In normal times, the principal object of government management has been to maintain the value of lawful money at equality with commodity money—gold. From 1821 to 1914, the Bank of England managed the British monetary system with the particular object of maintaining the convertibility of the pound into gold. And from 1920 to 1931, even more obviously, the British monetary system was managed with the object of attaining and maintaining the pre-war value of the pound in terms of gold. Somewhat similar to this object is the management of money by government to maintain its value in terms of a foreign currency, particularly a money convertible into gold. The government of India successfully managed the rupee for a long time with the object of maintaining its value in terms of the pound.

In abnormal times, when the fiscal needs of government have not been provided for by taxes and loans, many governments have made use of the monetary system to secure for themselves the purchasing power they required. This has been particularly true in time of war. The Continental Congress during the Revolutionary War secured about 60 per cent of its real resources from the issue of paper money.⁸ And nearly the whole of the income of the governments of Germany, Russia, and Austria during the inflation in those countries was secured in this manner. Every important instance of great and rapid depreciation of the value of money in recent times has been associated with the issue of paper money to provide for the needs of government. Occasionally, the money has been issued by central banks controlled by and carrying out the orders of governments. Professor

⁸ D. R. Dewey, *Financial History of the United States* (1931), p. 35.

Laughlin has suggested that the use of paper money to finance government has been due to a confusion of the fiscal with the monetary functions of government; but it is perhaps better regarded as government management of the monetary system for the purpose of providing itself with the real resources it requires.

A third object of government management of money has only recently come into prominence—the management of money so that it may better perform its functions of regulating the production, the distribution and the utilization of the national income. To some extent governments have undoubtedly long followed this policy, unknowingly if not deliberately. In recent times, this has been advanced as the object that governments should have in mind primarily in their management of money. The exclusion of gold by the Scandinavian countries during the war was largely for the purpose of stabilizing the value of their currencies. Whether the credit policies of the Federal Reserve system after the war were formulated with this object in view is still a matter of dispute; but it is probable that it was at least partly the purpose of Federal Reserve policies to stabilize business conditions. There can be little question that increasing emphasis is being placed upon the management of money to minimize variations in its value; and it is certain that the ultimate object of monetary management will tend even more in this direction.

The management of deposit money has generally had two objectives. First, government and bank officials have managed deposit money with the object of maintaining equality in its value with lawful money. The banking laws of this country, and the practice of the better banking institutions, have primarily had this object in view. Second, bank of-

officials have always managed the supply of deposit money for the purpose of maximizing their profit from the banking business. Too often this second object has led bank officials to overlook the primary object of management of deposit money. Altho there has been some attempt, particularly in the past few years, to manage the supply of deposit money with a view to regulating its effect upon industry, it cannot be said that this object has been achieved. The initiative in this has generally been taken by central banks, the commercial banks having hitherto been almost entirely passive in this aspect of the management of money. Deposit money is so important a part of the monetary system of this country that it is not too much to say that the ultimate success of monetary management for the purpose of regulating industry will depend upon the ability of the government and the Federal Reserve Banks to control the supply and the use of deposit money.

6. The Superiority of Managed Money

The three forms of money—commodity, representative, and managed money—have been used in the monetary systems of all countries. Before the war, gold coins were an important part of the circulation of almost all European countries, altho today their use is a rarity. Representative money in the form of gold certificates was an important part of the American monetary system until 1933. Outside of this country, representative money was almost unknown, altho Bank of England notes in some respects resembled gold certificates. By far the greatest reliance in most countries has been placed on managed money; and in the United States, on managed money in the form of deposits subject to check. This is largely due to the expense and inconvenience of

maintaining a modern monetary system completely on a commodity money basis.

In carrying on his business affairs a representative person finds it convenient to keep on hand a supply of money that is accepted without hesitation in payment for purchases and in payment of debts. This need is filled by the lawful money issued by authority of government, for within the national frontiers there is no hesitation in accepting payment in this form. For an individual, there is some inconvenience attached to making all payments in lawful money, particularly large or odd sums, and in transporting lawful money safely and cheaply. For such purposes it is preferable to have a supply of money in the form of demand deposits in commercial banks which can be drawn against as needed. Altho checks are not always accepted in the general course of business, they are so widely accepted and their convenience is so great that more than 90 per cent of the business of the country is transacted by means of deposit money. It is this need for a supply of deposit money subject to check that makes it possible for banks to make available to the community a quantity of deposit money; and for the community to use this deposit money in the same manner as lawful money.

The supply of lawful money that the community wishes to keep on hand, and the supply of deposit money that the community wishes to keep subject to check, are closely related. Altho this relationship is not constant, there is ordinarily no great variation in the proportion, at least during short periods. Normally, an increase or decrease in one form of money will set into motion forces tending to adjust the supply of the other until the lawful money on hand and the deposit money subject to check are once more in proper proportion to each other. For instance, if banks increase the

supply of deposit money, the community will find need for additional lawful money, and holders of deposit money will require banks to convert their deposits into lawful money. Occasionally there is a change in the proportion of lawful money to deposit money that the community desires to hold. In a period of distrust of the banking system, this takes the form of holding a larger proportion of lawful money. Because the supply of lawful money is not under the control of commercial banks, an increase in the community's desire for lawful money may lead to serious difficulties in the banking system.

In comparing the relative merits of a monetary system using commodity money exclusively and a monetary system using managed money, three tests may be applied: convenience, the expense of providing an adequate supply, and efficiency in regulating the production, distribution and utilization of the national income. Little need be said of the superior convenience of managed money, particularly in the form of deposits. The economy of using managed money is less apparent. The people of the United States require for the convenient carrying on of their affairs a supply of money of all kinds approximately equal to one-third the national income. The annual cost of maintaining such a large supply of commodity money (including the necessary increase) would be nearly 5 per cent of the national income, not much less than the cost of maintaining the federal government.⁹ This is a huge cost, and it can be justified only if it can be clearly shown that the superiority of commodity money in performing the money functions is equal to 5 per cent of the national income. In fact, however, the superiority of a monetary system using commodity money exclusively is not uni-

⁹ Cf. Adam Smith, *The Wealth of Nations*, Bk. II, chap. II.

versally admitted. There is a large group of economists who believe that managed money is better fitted to regulate the production, distribution and utilization of the national income.

Commodity money and money managed with a view to maintaining convertibility into the money commodity have not prevented violent changes in the purchasing power of money, and consequent disturbances in the industrial system. The history of prices in the United States indicates this clearly. Nevertheless, these changes have been moderate compared to some of the extreme changes that have taken place in the value of managed money in other countries, when the monetary system has been managed for the purpose of supplying real resources for the government. There is no denying that in the past when monetary systems have been entirely dissociated from a money commodity, the result has been a mismanaged money that has seriously disturbed the economic life of the community. It is not on how money has been managed, but on how money can be managed, that the advocates of monetary management rely for a justification of their views. Today the community is better prepared than it has ever been to give to the management of money the care and consideration it requires. It is altogether likely that the near future will see an approach to a money managed with the object of bringing about a proper production, distribution and utilization of the national income.

Chapter III

Gold and Other Monetary Standards

1. *The Meaning of the Standard*

THE monetary standard of a country is an important factor in determining the behavior of money and its effect on the industrial system. It is for this reason that the choice of a good monetary standard is the primary monetary problem of a community. There is nothing good or bad in any monetary standard except in the one sense that it is capable of performing the functions of money in a satisfactory or unsatisfactory manner. It is on this basis that the adequacy of any monetary standard must be ultimately tested.

Writers on monetary theory and practice attach a variety of meanings to the term *monetary standard*. Most commonly, it is used to designate the commodity into which all forms of money may be converted. "The standard money of any system is that kind of money in which all other kinds are made redeemable by the law of the nation."¹ A country is on a gold or a silver standard if its money is redeemable in one of these commodities. A country with an inconvertible paper money is said to have no standard, or to have a free standard. The monetary standard of a country is also said to be the form of money that has full and unlimited legal tender power. The objection to this use of the term is that a country may have several varieties of money, all of which have unconditional legal tender power. Finally, writers on

¹ E. S. Furniss, *Foreign Exchange*, p. 43.

monetary theory have used the term monetary standard to designate the object with which the monetary system is managed or ought to be managed. These various senses in which the term is understood are all useful in clarifying the problem of the choice and management of the monetary standard. For simplicity, the monetary standard is hereafter regarded as the basis by which the supply of money and its value in a country are ultimately limited.

In a monetary system based on gold or silver the supply of money is ultimately limited by the supply of the money metal, and the value of money is maintained equal to the value of the money metal. For short periods, a country may manage its money without regard to the supply and value of gold and silver, and still retain its monetary standard. However, such management of money affects its value relative to the money metal in its own and in other countries; and unless a country is prepared to build up a huge and unnecessary reserve, or to lose its accumulated reserve of the money commodity, it must eventually permit the supply of money to vary in the manner necessary to maintain its value equal to the value of the money metal. For any one country the task of managing its money without regard to the supply and value of gold or silver is particularly difficult, for it then becomes subject to a large drain or flow of the money commodity to or from the monetary reserves of other countries. It is very questionable whether any one country is so predominantly important in the economic affairs of the world as to be able to maintain the management of its money independent of the supply and value of the money commodity, and still remain upon its monetary standard. It would, perhaps, be possible for all the countries of the world to regulate for some time the supply and value of their money without

regard to the money metals; but in the long run, the value of money must conform to the cost of producing the gold or silver for which it is given or received.

The value of a unit of money freely given or received for gold or silver must at all times be equal, within small limits, to the value of the quantity of metal for which it is given or received. If the value of a unit of money is less than the value of the quantity of metal for which it is given, there is no inducement to convert the metal into money; and at the same time there is a strong inducement to convert money into metal. Where a commodity has alternative uses of different values, the more valuable use must always be preferred; and unless the value of the commodity is the same in the alternative uses, its supply will be diverted exclusively to the more valuable use. Similarly, where money is given for specified quantities of *either gold or silver*, and only one of the metals is more valuable than the money for which it is received, the more valuable metal will be used as a commodity, and the less valuable metal will be given for money. In this sense it is sometimes said that cheap money drives out dear money, and this principle is regarded by some writers as fundamental in monetary theory (Gresham's law). In fact, it is only a special application of the general economic principle of substitution—that is, the substitution of less expensive for more expensive means of securing the same economic effect. It is nevertheless very important in understanding the working of a monetary system based upon a commodity standard.

The maintenance of a monetary system based upon a commodity standard must in the long run limit the control a country can retain over the management of its money. It is sometimes said that a commodity standard provides an auto-

matic monetary system, and that the management of such a standard is fool-proof. The difficulty many of the most important countries have experienced in unsuccessfully attempting to maintain the gold standard is evidence that the management of money is no simple task, even with the gold standard. The severe economic depression during the recent period of falling prices, while this country was on the gold standard, is further evidence that a fool-proof standard may nevertheless be a foolish standard. To a large extent the severity of this depression was the result of attempting for a long time to regulate the supply and the value of money to make it conform to the value of the standard commodity.

2. *Bimetallism*

Silver coins have set the standard of value in most civilized countries until recently, and silver was well suited to be the chief material of current money in countries that had not advanced very far industrially and in which incomes were not very large.² Its inconvenience led to the use of gold by merchants engaged in large transactions, particularly in international trade; and to the adoption of monetary systems in which the values of gold and silver were linked to each other. Altho Ricardo considered silver superior to gold as a monetary standard, no serious consideration has recently been given to the maintenance of the currency of a large industrial nation on a silver standard. Only China among important countries is now on a silver standard; and the future use of silver in the monetary systems of the world is likely to be limited to subsidiary, or at most to auxiliary, purposes. There is no need, therefore, for extended consideration of the advantages and the disadvantages of the silver standard. In

² A. Marshall, *Money, Credit and Commerce*, pp. 54, 56.

principle they do not differ from the advantages and the disadvantages of the gold standards to be discussed below.

The values of gold and silver were linked to each other by making both the monetary standards of many countries. Full legal tender power was given to both metals, and their free coinage was undertaken by government. For monetary purposes the relative value of gold and silver was determined by the content of a unit of silver money and the content of a unit of gold money. Altho the market value of gold relative to silver could vary, its relative monetary value was fixed at the mint ratio. Since the uses of gold and silver in industry and in the monetary system were alternative, the continued use of these metals for both purposes required an equality of their values in industry and at the mint. The chief problem of the management of the double standard was to maintain the equality of the mint and market values of gold and silver, and to retain both metals in the monetary system.

It was generally assumed that a monetary system based upon the free coinage of gold and the free coinage of silver at a fixed ratio could be managed successfully. It was believed that the withdrawal of large quantities of one metal from use as money would so increase the value of a unit of money and so decrease the industrial value of that metal as to prevent its complete withdrawal from the monetary system. So long as the economic importance of the silver standard countries and the bimetallic countries was great enough, stability in the relative value of gold and silver was to a large extent possible. With the flight from silver by the more important silver using countries, it was impossible for the remaining countries to maintain fixed ratio mintage indefinitely. Of this Marshall wrote: ²

² A. Marshall, *Money, Credit and Commerce*, p. 63.

It may be admitted that an agreement, entered into by all the commercial countries of the world to keep their mints open to gold and silver at almost any reasonable ratio, would tie the values of the metals to the ratio, so long as the agreement lasted, unless indeed one of the two metals were driven absolutely out of circulation. But it seems probable that—as human nature is constituted—such an agreement would not endure very long after changes in the conditions of mining had made the relative costs of production of the two metals differ widely from their relative ratings in the agreement. Especially, if gold were the metal which the change had caused to be underrated, the knowledge that the demand for it in the arts of production was large and urgent, would induce some governments to manipulate their stocks in favour of gold: for they would know that if the agreement were broken up, they would gain much more advantage from the possession of a large stock of gold, than from the possession of a stock of silver which, though equivalent to it under the rating, would be of much lower value after the rating had ceased to be effective.

It is more than the possible bad faith of governments that would prevent the successful maintenance of a bimetallic standard by international agreement. Even an international double standard cannot be long maintained except at the ratio of the relative costs of producing gold and silver. Eventually, the stimulus given to the production of the overrated metal and its diversion from industrial uses would considerably increase its monetary supply; and the underrating of the other metal would decrease its production and lead to its diversion from monetary uses, until the monetary systems of the world would be based exclusively on the overrated metal. A single country undertaking to maintain a bimetallic standard at a ratio differing from that prevailing in the industrial market and at other mints would be quickly stripped of its

supply of the underrated metal, for the mints of other countries would be prepared to absorb an unlimited supply. For this reason, countries on a bimetallic standard were, in fact, on an alternate standard of either gold or silver, depending upon changes in the normal cost of producing the two metals.

The economists who advocated a bimetallic rather than a single gold or silver standard urged two advantages in its favor: First, it made possible fixed instead of fluctuating exchange rates on gold, silver and bimetallic standard countries; second, it made possible greater stability in the value of money than could be secured by a single gold or silver standard. So long as both gold and silver continued to be utilized in the monetary systems of bimetallic countries, a fixed par of exchange could be maintained on all gold, silver and bimetallic countries. In fact, bimetallic countries had alternate standards of gold or silver. Under the circumstances, exchange rates could not be maintained at a fixed par after the overrated metal had completely displaced the underrated metal in the monetary system of a bimetallic country. It is nevertheless probable that bimetallism did, to some extent, minimize variations in exchange rates between countries on different metallic standards.

Similarly, there was probably some tendency for bimetallism to minimize fluctuations in the price level. If the value of money in bimetallic countries were determined by the average value of gold and silver, as some bimetallists claimed, there would be little question of the superiority of bimetallism in maintaining more stable prices. In fact, a bimetallic standard did not fix the value of money at the average value of gold or silver, but alternately at the value of one or the other. Even an alternate standard probably had a slight tendency to diminish fluctuations in the value of

money so long as the monetary system was really based on an alternate standard. But as the cost of producing one metal departed considerably and for a long time from the mint value, a mono-metallic standard was established in fact. Thereafter the value of money in a bimetallic country would vary precisely in the same manner as the value of money in countries having for their single standard the metal over-rated at the mint of the bimetallic country.

The double standard does not provide a monetary system based on gold *and* silver, but one based on gold *or* silver. On several occasions Alfred Marshall suggested a plan, symmetallism, whereby the money of a country could in fact be linked to both metals. He proposed that a unit of money should be exchangeable for a given quantity of gold together with a given quantity of silver. For convenience, the gold and silver could be put up in the form of standard bars. The extent to which the value of a unit of money would be determined by either metal would depend upon the relative quantity of each given in exchange for money. "If we wished the value of the currency to be regulated chiefly by gold we should have only a small bar of silver; if chiefly by silver we should have, perhaps, 50 or 100 times as heavy a bar of silver as that of gold. But if we wished the two metals to have about equal influence, we should, taking account of the existing stocks of the two metals, probably choose our silver bar about 20 times as heavy as that of gold." ⁴ The relative weights of the bars of silver and gold would be fixed once for all. Altho it is generally admitted that the value of a unit of money could in this way be linked to the average value of gold and silver, the proposal has received little official consideration.

⁴ A. Marshall, *Money, Credit and Commerce*, p. 65. See also, *Memoirs of Alfred Marshall*, pp. 204-206, and *Official Papers of Alfred Marshall*, pp. 14-15, 28-29, 166-167.

The bimetallic standard was the basis for the monetary systems of most European countries at some time. England was the first to abandon the bimetallic standard (1816), giving legal recognition to the disappearance of silver from its monetary system. The abandonment of bimetallism by all countries in the 1870's and later was due to the great changes that took place in the supply of gold and silver from 1850 to 1870. The discovery of gold in California and Australia and the great production of the 1850's resulted in the displacement of silver by gold. The silver flowed to the Orient where it was absorbed without difficulty. At this time the world's production of goods was increasing rapidly, and silver was under any circumstances approaching the point where it would become inconvenient for every day use. The replacement of silver and gold by gold alone until 1870 was not only accompanied by no great disturbance, but was itself a convenience for trade. From 1848 to 1859, the value of silver in terms of gold rose slightly. After 1860 the situation changed. The production of silver increased tremendously, and the output came into a world prepared to make greater use of gold as the money metal. The value of silver began to fall, and by 1873 the fall was marked. Governments and banks hesitated to use silver for their monetary reserves. Thus the fear that silver might prove unstable in value and undesirable as a monetary standard brought about instability in the value of silver and its demonetization.

The process of demonetizing silver was gradual. Altho Great Britain formally adopted the gold standard in 1816, the Bank of England maintained reserves of silver until 1853. In 1871, the newly formed German Empire adopted a gold standard, giving impetus to the movement to demonetize silver. In 1872, the Scandinavian countries, Norway, Sweden, and Denmark, adopted a gold standard under a monetary

convention. In 1873, Holland suspended the free coinage of silver. The Latin Monetary Union, organized in 1865 for the purpose of regulating the supply of silver coin, discontinued the free coinage of silver in 1873 and 1874. In the United States, silver had not been coined during the 1850's and the 1860's, and the silver dollar was omitted from the list of authorized coins in the Act of 1873. Nevertheless, agitation for the free coinage of silver continued in the United States until 1896; and government purchases of silver under the Bland-Allison and the Sherman Acts helped to sustain the price of silver until 1893.

The European countries that returned from paper money to a metallic standard did not return to silver. Austria found that the fall in the gold value of silver brought the value of its paper money to the original silver basis, and closed its mints to the free coinage of silver. In 1892 a gold standard act was passed which became effective in the course of a few years. In Russia, the situation was somewhat similar. The paper rouble was the actual standard, altho the country was nominally on a silver standard. In 1893, the value of the rouble was equal to its former silver content, and the free coinage of silver was suspended. The next year the government adopted a modification of the gold standard, offering to provide marks, a gold standard money, at a fixed price in roubles. India was in a somewhat different position. It had never been off the silver standard, and silver coins were the common money of the country. But its close financial relations with England made a fluctuating exchange a source of difficulty. In 1893 the mint was closed to the free coinage of silver, and in 1899 the government of India undertook to provide sterling for rupees and rupees for sterling within a narrow range of rates. With the closing of the Indian mint

to the free coinage of silver, the gold value of silver fell sharply, and the practical possibility of re-establishing fixed ratio mintage was completely gone.

In 1933 the continued fall in the price level and the very low price of silver brought about a renewal of the proposal for the free coinage of silver at a fixed ratio to gold. At the World Economic and Monetary Conference in London, June, 1933, an agreement was concluded among the participating nations to maintain the fineness of silver coin at not less than eight-tenths, and to replace low denominations of paper money with silver coin as conditions permit. The chief producers and users of silver concluded another agreement providing for limitation of the supply of silver to be thrown on world markets with the object of raising the price of silver. A proposal by Senator Pittman of the United States that monetary reserves be kept partly in the form of silver (15 per cent) and partly in the form of gold (25 per cent) was not adopted.

Any plan for the increased use of silver in the monetary systems of the world is hereafter more likely to take this form of auxiliary use of silver than the form of restoring free coinage of silver at a fixed ratio to gold. The Bank Act of 1844 permitted the Bank of England to hold one-fourth of its reserves in the form of silver. Nevertheless, after 1853 the Bank ceased to hold any reserve of silver against its notes. The Silver Purchase Act of June, 1934, states it to be the policy of the United States to maintain one-fourth of its metallic monetary stock in the form of silver, and directs the Secretary of the Treasury to purchase silver for this purpose. This plan for using silver to supplement the gold reserves, and to relieve the strain upon the limited gold supply of the world, is by no means new. It was long advocated by the

distinguished economist Leon Walras, who held that the value of gold could be regulated to some extent by increasing or decreasing the quantity of silver used in the monetary systems of the leading countries. That silver may yet be used for this purpose is not unlikely; but this cannot be regarded as bimetallism in its historic form.

Ratio of Value of Gold to Silver, 1845-1930

1845.....15.92	1875.....16.58	1905.....33.87
1850.....15.70	1880.....18.04	1910.....38.22
1855.....15.38	1885.....19.39	1915.....39.84
1860.....15.29	1890.....19.77	1920.....20.27
1865.....15.44	1895.....31.60	1925.....29.38
1870.....15.57	1900.....33.33	1930.....53.38

3. *The Various Gold Standards*

The gold standard was the basis of the monetary system of most western countries from 1870 to 1914. The exigencies of war compelled the abandonment of the gold standard in nearly all belligerent countries and in most neutral countries. Altho it was re-established after a time—by 1928 all the important belligerent countries were back on a gold standard—the maintenance of the standard became increasingly difficult, and in recent years the gold standard has been suspended, or its operation seriously restricted in almost all countries. The tests of the gold standard are the free coinage of gold and the free convertibility of money; and the unrestricted use and export of gold and of foreign exchange. If government or the central bank is prepared to buy or sell gold without restrictions at a fixed price, or at a price varying within narrow limits, the country may be said to be on a gold standard.

The simplest form of the gold standard is the gold coin standard. In such a monetary system, the money of a country is convertible into gold coin. Thus, the United States formerly minted five-, ten- and twenty-dollar gold pieces, and any quantity of money in multiples of five dollars could be converted into gold coin. The gold coin standard was the common form of the gold standard before the war. Where this standard prevailed, gold coins were generally in circulation, particularly in those European countries where paper money was not available in relatively small denominations. While some gold coin circulated in the United States, it was never an important part of the money actually in use. The gold coin standard is sometimes spoken of as the gold circulation standard.

The expense of a gold coin standard, and the danger of an exhaustion of a reserve of gold coin by the conversion of small quantities of money at a time of public apprehension, led David Ricardo to suggest the use of a gold bullion standard. He proposed that the currency within the country should consist of notes, and that these notes should be convertible into stamped bars of gold weighing 20 ounces. The proposal was not adopted at the time, but it became the basis for the gold standard that prevailed in England from 1925 to 1931. Bank of England notes and currency notes were made convertible into gold bars of 400 ounces at the fixed price of 3£ 17s. 10½*d.* per standard ounce, eleven-twelfths fine. Thus, those requiring gold in large quantities, or for export, could secure it, while the expense and the inconvenience of using gold coin in the circulation of the country was avoided.

The maintenance of a reserve of gold, whether in the form of coins or bars, is in itself a great expense, requiring a large

investment in an idle reserve on which the loss in interest may be a considerable sum. There are also other expenses attached to the management and care of a gold reserve. The gold exchange standard avoids these difficulties while relating the money of a country to gold. The chief demand for gold in exchange for money comes from those requiring gold to meet payments due in other countries, and if foreign exchange could be provided for such persons it would suit their purpose as well as gold. The device of offering gold exchange in redeeming money was first used by Holland in linking the money of its Asiatic possessions with the money of the mother country. Dutch colonial money was made convertible into guilders, and in this manner was indirectly related to the gold standard. Those actually requiring gold could convert colonial money into guilders and guilders into gold in Holland. The gold exchange standard is thus based on the free coinage of gold and the free convertibility of money in another country. By this same device Russia succeeded in stabilizing the foreign exchange value of the rouble and indirectly its value in gold. The best known use of the gold exchange standard is that of India, in which the normal exchange value of the rupee was stabilized at 1s. 4d. by offering to buy sterling with rupees (Council bills) and rupees with sterling (reverse Council bills). In this manner the rate of exchange for rupees was for a long time maintained within small variations of 1s. 4d. Those who wished to secure gold for rupees could do so indirectly by converting sterling into gold in London. The gold exchange standard was also used in other countries, including the possessions of the United States. After the war it was widely used as a step toward the re-establishment of the gold standard in countries having an inconvertible paper money.

The chief advantage of the gold exchange standard is its

great economy compared with the gold coin or gold bullion standard. Instead of maintaining an idle reserve of gold, the currency reserve may be invested in the country whose foreign exchange is to be offered in conversion for domestic money. Further, the change from a paper to a gold standard can be carried out with a minimum of strain upon the monetary systems of the world, for there is no need to withdraw gold from the reserves of other countries. The chief objection to the gold exchange standard is that it ties the money and prices of the country to the monetary system of another country, and requires management of the domestic monetary system in accordance with the policy of this other country. A second objection, of recent importance, is the possibility of great loss thru the abandonment of the gold standard by the country in which the reserves are invested.

It is sometimes said that a country cannot be regarded as on the gold standard unless the legal tender power is restricted to money convertible into gold. In countries that passed from bimetallism to the gold standard, there were frequently large quantities of standard silver coin in circulation. While the coinage of such money was stopped or limited, there was generally no restriction on the legal tender power of such silver coins. The result was that the government or the central bank maintained the value of a unit of money at equality with a given quantity of gold, but debts could nevertheless be paid in standard silver coins. In the United States the silver dollar, and before the war in France and other countries of the Latin Monetary Union, the silver five-franc piece, were full legal tender. A country combining the free coinage of gold and the free convertibility of money with the use of standard silver coins as legal tender is said to be on a limping gold standard.

A modified form of the gold standard that has frequently

been suggested, but that has never been tried, is the gold value standard. Under this system the price of gold would be varied inversely with the price level. Thus, a unit of money would be made convertible into a variable quantity of gold having a constant value, rather than a fixed quantity of gold having a variable value. The gold value standard could be adapted to the monetary system of any country using paper money without great difficulty. Detailed consideration of the gold value standard must be postponed for discussion with other proposed monetary changes.

The gold standard is obviously not a simple, uniform device in all countries that link the value of their money to the value of gold. It differs from country to country and from time to time. The various forms the gold standard has taken are partly the result of historical differences in the monetary systems of different countries, and partly the result of particular exigencies growing out of unusual circumstances. It is, therefore, impossible to say what forms the gold standard may yet take. It is conceivable, altho not likely, that methods will be developed for controlling the value of gold that will make possible in gold standard countries a monetary system combining the good features of a metallic and a managed standard. Until that time, however, the desirability of the gold standard must be considered on the basis of recent experience with the forms now prevailing.

"The choice of gold as a standard of value is chiefly based on tradition." ⁵ The importance of historical continuity in the monetary standard cannot be denied, altho, on the whole, it has been exaggerated. The single gold standard is a comparative novelty in modern monetary systems. As the legal basis for money it was first established in England less than

⁵ J. M. Keynes, *Essays in Persuasion*, p. 181.

120 years ago, and in all other countries less than 70 years ago. There is not a major industrial country in the world that has used the gold standard continuously for the past 60 years. With the complete passing of the gold coin standard and the substitution of notes issued by governments and central banks and of deposit money supplied by commercial banks, the importance of historical continuity is materially weakened. The ultimate choice of a monetary standard cannot be made to depend upon a historical accident, for that would perpetuate an unsatisfactory monetary system.

The relative stability in the value of gold has generally been accepted as a good reason for the use of the gold standard. The relative stability in the value of gold is attributed to several causes. The existing supply, being large compared to the annual output, prevents even a large change in production from affecting the value of gold very much or very quickly. Further, gold is a commodity and its supply will depend upon its value. If the value of gold should rise relative to the cost of producing it, forces would be set into motion increasing the production of gold and counteracting any tendency toward a continued rise in its value. Finally, the use of gold in art and in industry, as well as for monetary purposes, is an important reason for its relative stability in value. The demand for gold for non-monetary purposes is probably elastic, so that a rise in the value of money brings about a decrease in the non-monetary uses of gold, and makes available a large proportion of the new output for monetary purposes. The fact that the gold standard is everywhere a managed gold standard, and not a commodity gold standard, may also cause governments and central banks to manipulate their holdings of gold relative to the quantity of lawful money by economizing its use during high value

periods and expanding its use during low value periods in such a way as to counteract in part a tendency for the value of gold to change. There is no evidence, however, that this is in fact so.

These forces undoubtedly aid in the stabilization of the value of money in a country on the gold standard. They would be equally applicable in a monetary system based upon silver, or any durable commodity. The value of gold may vary less than the value of any other commodity, altho this has been questioned; but even small variations in the value of gold have had unfortunate effects upon the economic organization of gold standard countries. No doubt, the use of the gold standard in the past has been a great help in avoiding the large changes in the value of money that have been common in countries where government has controlled the supply of money and managed it to provide itself with real resources. However, there is no reason to believe that a monetary system managed to maintain the value of a unit of money equal to the value of a given quantity of gold would be better than a monetary system managed to maintain economic equilibrium.

Another advantage claimed for the gold standard is that it stabilizes the rates of exchange on other gold standard currencies; and that this stability in rates of exchange is a great aid in carrying on international trade, since business men are always certain of the price to them in their own money of goods bought or sold in terms of foreign money. It cannot be denied that there is some advantage in stable exchanges, altho Marshall and others have held that the evils of fluctuating exchanges have been exaggerated. Stability of the exchanges can be attained only when many countries are on the same commodity standard. The departure of many

countries from the gold standard eliminates or minimizes the importance for any one country of retaining the gold standard for the purpose of stabilizing exchanges. Most important of all, it may be necessary for a country to choose between stability in the value of its money and stability in the foreign exchanges, for exchange stability can be secured only by permitting the value of money in a country to vary in the same manner as the value of money in other countries.

4. *A Managed Standard*

It must be understood that the gold standard in most countries is in fact a managed gold standard. That is, the principal forms of money are lawful money and deposit money, and the quantity of these forms of money must be managed to maintain equality of their value with a given weight of gold. The monetary systems of such countries are managed with a view to maintaining the gold standard. Hitherto, countries have not attempted to manage the value of gold, altho it has been argued by some economists that the value of gold from 1920 to 1924 was largely determined by the policies of the American monetary authorities. Altho the value of gold can probably be managed to a slight extent and for a short time, it is impossible to continue to control the value of money in a country on the gold standard. Even concerted action by many important countries cannot be successful for long. Ultimately, the value of money must be permitted to conform to the cost of producing the necessary supply of gold.

It is this final dependence of the value of money on gold that is the principal objection to the gold standard. In the past, when the problems of money were little understood, "the—in itself foolish—superstition that gold is the natural

representative of value has done excellent service.”⁶ But it ought not to be a bar to an improved monetary system. A country must choose between linking the value of money to gold, and keeping its economic system in equilibrium. It cannot long do both. It is possible that the gold value standard or a similar device can be developed for using gold in the monetary system without tying the value of a unit of money to the value of a quantity of gold. Only in this manner can a monetary system based on gold be managed satisfactorily.

In contrast to the limitation upon variations in the value of money in countries on a gold standard, the value of money in countries on a free paper standard depends upon the management of the monetary authorities. Well-managed, a free standard can do much to maintain equilibrium in the economic system. Managed carelessly, or with the object of providing purchasing power to government as an alternative to taxes and loans, the free standard opens the way to intolerable abuses. The mismanagement of the monetary system in many countries during and after the World War has led to justified skepticism of the practicability of satisfactory management of a monetary system independently of gold. Ultimately, the choice of a monetary standard will have to be made on the basis of its suitability for maintaining economic equilibrium, and for this purpose a managed standard will undoubtedly be found superior to a gold standard.

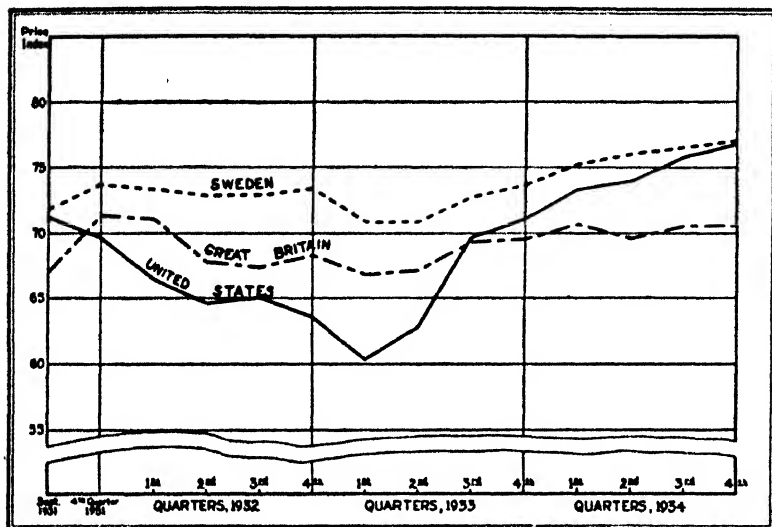
There are few instances in which the monetary system of a country has been managed with a view to stabilizing the value of money or maintaining economic equilibrium. The instance has already been cited of the deliberate abandonment of the gold standard by Sweden during the war in order

⁶ *Memorials of Alfred Marshall*, p. 33 n.

to avoid the rise in prices that followed from the depreciation in the value of gold. Nevertheless, that country later returned to the gold standard. In September, 1931, the great increase in the value of gold, and the impracticability of bringing about a sufficient fall in the domestic price level to maintain exchange stability, forced Sweden off the gold standard once more. In the past few years the monetary system of that country has been managed with a view to maintaining stability in the price level. From the abandonment of the gold standard in 1931 to February, 1935, the price level in Sweden rose about 7 per cent. The experience of Great Britain in the same period has been quite similar. Between September, 1931, when the gold standard was suspended, and February, 1935, the price level in that country rose about 6 per cent. In this same period the price level in gold standard countries fell more than 25 per cent. By February, 1935, the average level of wholesale prices in gold standard countries had fallen to approximately 50 per cent of the 1926 level.

The situation in the United States is in many ways unique. Great Britain, Sweden and other countries were forced off the gold standard by their inability to bring about a balance in their international payments, due to changes in the value of gold and in the world demand for their export products. The United States could undoubtedly have continued on the gold standard. Instead, it was deliberately abandoned for the purpose of bringing about a sufficient rise in the price level to restore economic equilibrium. From April, 1933, when the gold standard was formally abandoned, to August, 1934, the wholesale price level of commodities rose by more than 25 per cent, altho price levels in gold standard countries continued to fall. Altho this rise in the American price level has not been sufficient to restore economic equilibrium,

there can be little question that the volume of production and employment is much larger than it would have been if the price level in this country had continued to be dependent on the value of gold.



Prices in the United States, Sweden, and Great Britain
1931-1934

In proposing a monetary system managed for the purpose of minimizing variations in the price level and for the purpose of maintaining economic equilibrium, the suggested change from current practice altho important is not great. The monetary systems of gold standard countries are now everywhere managed monetary systems. The novelty is not in undertaking management of the monetary system, but in directing management to a new end—the proper production, distribution and utilization of the national income. A monetary system managed for this purpose undoubtedly requires more careful supervision than a monetary system managed to maintain convertibility of money into gold. Nevertheless,

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the importance to the community of some degree of stability in prices and of the maintenance of economic equilibrium is so great that it is impossible to avoid much longer the reorganization of the monetary systems of the world upon this basis. Many of the important and difficult technical problems are still to be solved; but the monetary authorities

Prices in the United States, Sweden and Great Britain

1931 to 1934*

	U. S.	Sweden	Great Britain
September, 1931	71.2	71.8	67.0
4th Quarter, 1931.....	69.7	73.6	71.3
1st Quarter, 1932.....	66.5	73.3	71.1
2nd Quarter, 1932.....	64.6	72.9	67.8
3rd Quarter, 1932.....	65.0	72.9	67.4
4th Quarter, 1932.....	63.6	73.3	68.2
1st Quarter, 1933.....	60.3	70.9	66.8
2nd Quarter, 1933.....	62.7	70.9	67.1
3rd Quarter, 1933.....	69.7	72.7	69.3
4th Quarter, 1933.....	71.0	73.6	69.5
1st Quarter, 1934.....	73.2	75.2	70.6
2nd Quarter, 1934.....	73.9	76.0	69.6
3rd Quarter, 1934.....	75.6	76.5	70.5
4th Quarter, 1934.....	76.9	77.0	70.4

* Commerce Reports, U. S. Department of Commerce. 1926 = 100.

have learned much in recent times. Despite the limited experience of this and other countries with monetary systems managed for the purpose of maintaining stability in prices and in the economic system, there is reason to believe that monetary systems can be successfully managed to attain this end.

Chapter IV

The Quantity of Money

1. *The Supply of Gold*

THE quantity of money in a country is a matter of vital importance to its economic well-being. Without entering into the relation between the quantity of money and the level of prices, it may be noted at this point that a continued increase in the quantity of money is likely to be accompanied by a rise in prices, and that a continued decrease in the quantity of money is likely to be accompanied by a fall in prices. Because the production, the distribution, and the utilization of the national income are closely related to prices, it is essential that the quantity of money should be just sufficient to prevent a large movement in prices, and a consequent disturbance in the national economy.

The quantity of money in all countries on the gold standard, and in those countries in which the monetary system is managed with reference to gold, is largely dependent on the supply of monetary gold. The gold available for monetary purposes consists of gold coin in circulation, and the gold reserves maintained by governments and central banks. Gold coin is no longer an important part of the money in circulation in industrial countries, altho before the war gold coin was in common use, particularly in Europe. The paper money of these countries was in relatively large denominations—the smallest Bank of England note was for five pounds—and the need for money of moderate denomina-

tions was filled by gold coin. Since the war, the smaller denominations of paper money have completely replaced gold coin. Now, the most important monetary use of gold is as a reserve for lawful money issued by governments and central banks, and for deposit money created by commercial banks.

In the short run, the world supply of monetary gold is relatively fixed. There is some transfer of gold from industrial to monetary uses as the value of money increases, but the increase would have to be great before any large quantity of gold would be transferred from industrial to monetary uses. There is probably a greater transfer of gold from hoards to monetary uses after a large increase in the value of money. The recent rise in the value of gold is said to have released hundreds of millions of dollars from the hoarded gold of India. Generally speaking, any considerable increase in the gold holdings of a country must therefore be withdrawn from the gold holdings of other countries. Thus, altho the world supply of gold is almost fixed for short periods, there is nevertheless considerable elasticity in the supply available for use by any one country. The actual distribution of gold among the nations of the world is determined by fundamental economic forces, so that the existing gold holdings cannot be considered arbitrary, nor can changes in these holdings be considered adventitious.

Any considerable increase in the quantity of gold available for monetary uses for the world as a whole must come from the annual output of the mines. The annual production of gold, and the part added to the monetary supply, is small compared to the total stock of gold available for monetary uses. The world supply of monetary gold is estimated at somewhat more than 600 million fine ounces. The highest

The Monetary System

annual average of gold production for a five-year period, 1930 to 1934, was only slightly more than 23 million fine ounces. The annual output for the past ten years has been little more than 4 per cent of the monetary stock of gold;

Monetary Gold of the World *

(Thousands of fine ounces)

December 31, 1913	December 31, 1932
United States 92,106	United States 218,316
France 58,050	France 157,424
Russia 48,907	Great Britain 28,200
Germany 44,263	Switzerland 24,472
Great Britain 40,151	Spain 21,087
India 18,092	Netherlands 20,081
Austria Hungary 14,319	Russia 17,787
Argentina 14,126	Belgium 17,456
Italy 12,819	Italy 14,829
Australia 10,449	Argentina 12,088
Other Countries 45,279	Other Countries 76,294
World Total..... 398,561	World Total..... 608,064

* Estimates of the Director of the Mint.

and of this output, a large part is used in industry and is hoarded in the East. The annual increase in the monetary stock of gold has in recent years been between 2 and 3 per cent. On the whole, the annual output of gold has been

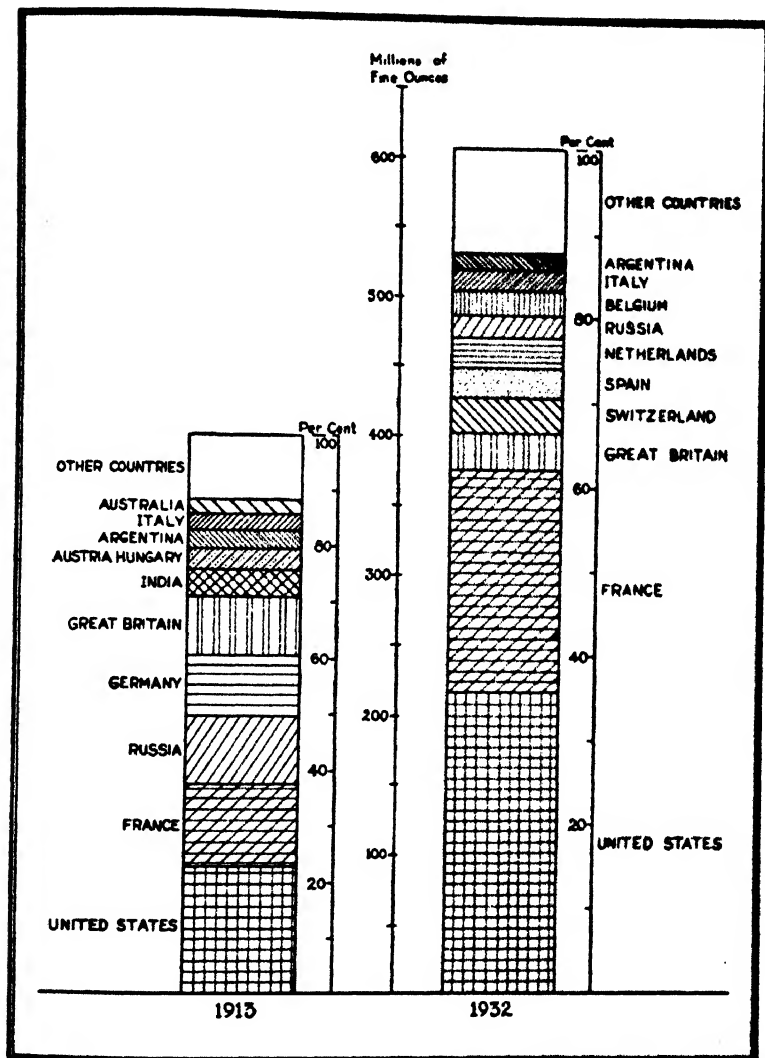
Rapid Changes in the Gold Holdings of the United States*

(Thousands of fine ounces)

June 30, 1915..... 95,444	June 30, 1920..... 130,951
June 30, 1916..... 118,519	June 30, 1921..... 159,347
June 30, 1917..... 145,996	June 30, 1922..... 183,051

* Estimates of the Director of the Mint.

remarkably stable in the last half-century, varying from 3 per cent of the monetary stock of gold in 1883 to 7 per cent of the monetary stock of gold in 1908.



Monetary Gold of the World
1913 and 1932

The Monetary System

Annual Production of Gold in All Countries, 1894-1933* (Thousands of fine ounces)

1894... 8,764	1904... 16,804	1914... 21,875	1924... 18,667
1895... 9,615	1905... 18,396	1915... 23,010	1925... 18,734
1896... 9,783	1906... 19,471	1916... 22,400	1926... 19,251
1897... 11,420	1907... 19,977	1917... 20,457	1927... 19,180
1898... 13,877	1908... 21,422	1918... 18,701	1928... 19,399
1899... 14,837	1909... 21,965	1919... 17,376	1929... 19,585
1900... 12,315	1910... 22,022	1920... 16,130	1930... 20,836
1901... 12,625	1911... 22,397	1921... 16,006	1931... 22,329
1902... 14,354	1912... 22,605	1922... 15,576	1932... 24,141
1903... 15,852	1913... 22,928	1923... 17,977	1933... 23,944

* Estimates of the Director of the Mint.

World Production of Gold by Countries, 1932 * (Thousands of fine ounces)

Transvaal	11,558
Canada	3,050
United States	2,219
Russia	1,990
Australia	667
Mexico	584
Rhodesia	580
Other Countries	3,493
World Total.....	24,141

* Estimates of the Director of the Mint.

In the long run the stock of monetary gold is determined by the annual output of the mines, and by the uses to which the product is put. To some extent the production of gold is dependent upon chance discoveries of new fields, and is so far independent of economic forces. But normal variations in the production of gold are largely determined by changes

in the value of gold. A rise in the value of gold will lead to an expansion of gold production, the use of inferior ores and the more intensive working of the better mines; and a fall in the value of gold will lead to a contraction of gold production in the same manner. The increase or decrease in production is relative to what would have been produced had there been no change in the value of gold. Similarly, a rise in the value of gold will bring about a smaller use of the metal for industrial purposes, thus making a larger part of the annual output available for monetary uses. A change in the value of gold therefore influences the addition to the monetary stock in two ways, first by increasing or decreasing the production of gold, second by increasing or decreasing the proportion of the changed output available for monetary uses.

Effect of the Price Level on the Production of Gold*

Year	Price Index	Production in Fine Ounces	Year	Price Index	Production in Fine Ounces
1916.....	125	22,400,370	1929.....	139	19,585,536
1917.....	172	20,457,475	1930.....	126	20,836,318
1918.....	191	18,701,294	1931.....	107	22,329,525
1919.....	202	17,376,201	1932.....	95	24,141,486
1920.....	226	16,130,273	1933.....	96	23,944,000

* The price index is that of the Bureau of Labor Statistics index number of wholesale prices, 1910-1914 = 100; the production of gold is from estimates made by the Director of the Mint.

The value of gold, like the value of any economic good produced by man, must in the long run be equal to its cost of production. That is, over a period so long that the cost of production can sufficiently influence supply, the value of a good is determined by its cost of production. For gold this

period is exceptionally long, because the durability of gold has enabled the available supply to become very large relative to the annual output. In the short run, the value of gold is determined by the equilibrium of the supply of and demand for gold, and since supply is relatively fixed, the short-period variations in the value of gold are caused almost exclusively by changes in the monetary demand. Nevertheless, forces are always at work tending to bring the value of gold into equality with its cost of production. A change in demand causes a change in value, and induces producers of gold to vary the output in the same manner as the value of gold. These variations in output cause variations in the monetary supply of gold, and thus counteract to some extent the influence of the change in demand, directing the value of gold to the normal cost of producing the annual output that the world requires.

The supply and value of gold is related to its cost of production in precisely the same way that the supply and value of any durable good, say, houses, is related to its cost of production. That is, the value of the good determines up to what point costs are incurred in putting a supply on the market. Allowance must be made for the non-variable costs that may induce a business man to maintain production temporarily at a total cost in excess of the market price, provided the price is sufficient to meet the prime costs of production. In the supply of gold, the non-variable expenses of production are sufficiently large to bring about a noticeable lag in the tendency of production costs to be incurred up to the market value of gold. The relation of the value of gold to its cost of production may be summarized as follows: the value of gold determines how far costs—in the short run prime costs, in the long run total costs—are incurred in pro-

ducing the annual output; the costs incurred determine the volume of the annual output; over a long enough period, the output of many years determines the supply of gold; and the supply of gold, in conjunction with the demand for gold, determines its value. It must not be overlooked that the value of gold for short periods is influenced to a very large extent by the quantity of other money—lawful money and deposit money—that the monetary and banking authorities make available.

2. *The Supply of Lawful Money*

The supply of lawful money in countries on the gold standard is related to and limited by the supply of gold available as a monetary reserve. This relationship is difficult to show statistically because in the short run small variations in the supply of gold may not affect the supply of lawful money; and in the long run the regulations on the supply of lawful money relative to gold may be changed by law. Nevertheless, the general dependence of the supply of lawful money on the supply of gold is fairly evident.

Monetary Gold and Money in Circulation
(Millions of dollars)

Year	Monetary Gold*	Money in Circulation**	Year	Monetary Gold*	Money in Circulation**
1898.....	862	1,838	1916.....	2,445	3,649
1901.....	1,125	2,203	1919.....	3,113	4,877
1904.....	1,328	2,553	1922.....	3,785	4,463
1907.....	1,466	2,814	1925.....	4,365	4,811
1910.....	1,636	3,149	1928.....	4,109	4,797
1913.....	1,871	3,419	1931.....	4,956	4,822

* December 31st of each year, in dollars of 23.22 grains of fine gold.

** June 30th of each year.

The issue of notes is now controlled and limited in all countries. The simplest limitation that can be put upon the issue of paper money is that the issuing authority may exercise complete judgment as to the amount of the issue, but that it must redeem the money in coin on demand. Dunbar speaks of this type of bank of issue as a "primitive system" of regulating the supply and value of money. The Bank of England prior to the Bank Charter Act of 1844 was free from any limitation on its note issue other than this requirement of redemption; and similarly, until 1848 the Bank of France had no other limitation upon its note issue. The system is no doubt simple, but it permits an elasticity in the supply of lawful money that is exceedingly desirable. The requirement of redemption in specie is in itself a great limitation. In fact, the more stringent limitations that have since been placed on the issue of lawful money are for the purpose of assuring redemption under all conditions.

A limitation upon the issue of notes that was much used in the United States, and is still used in Canada, placed the maximum note issue of a bank at the amount of its capital. The first and second Banks of the United States, 1791-1811 and 1816-1836, were forbidden to issue notes in excess of their authorized capital. The present National Banking Act limits the note issue of a national bank to its authorized capital. The banks of Canada have the right to issue notes, but this right is restricted by the provision that the maximum issue must not exceed the paid-up capital of the bank, and that notes must be redeemable in Dominion notes and coin. By 1946 the maximum note issue of Canadian banks will be limited to 25 per cent of their paid-up capital.

Since 1844 the note issue of the Bank of England has been limited to a fixed amount secured by government debt and

The Quantity of Money

Gold Reserve Requirements on Notes*

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Country	Gold Coin and Bullion	Remarks
Belgium	30 per cent	10 per cent additional must be kept in gold or in gold exchange. The reserve is in proportion to the demand obligations of the state bank.
Canada	25 per cent 100 per cent	25 per cent on Dominion notes up to \$50 million. 100 per cent in gold must be kept on notes in excess of this amount.
France	35 per cent	This reserve of gold must be kept on notes and demand deposits of the state bank.
Germany	30 per cent	On the notes of the state bank.
Great Britain	100 per cent	On Bank of England notes in excess of £260 million.
Italy		A reserve of 40 per cent in gold or gold exchange must be kept on demand obligations of the state bank.
Japan	75 per cent	On notes in excess of 120 million yen.
Sweden	50 per cent	On notes in excess of 250 million kronor. Minimum reserve, 150 million kronor.
Switzerland	40 per cent	On notes of the state bank.
United States	40 per cent	On Federal Reserve notes. Reserve of \$150 million must be held against United States notes.

* League of Nations, *Legislation on Gold*, 1930.

other securities, and to any amount in excess of this fixed fiduciary issue secured entirely by gold. The monetary system of England was modified during the World War, but in the post-war revision, the principle of a fixed fiduciary issue was retained. The Bank Charter Act of 1844 authorized the Bank of England to issue £14 million in notes upon a reserve of government obligations. Notes in excess of this amount could be issued upon deposit in the issue department of the Bank of England of gold coin or bullion to the full amount of the excess. The Bank was required to redeem its notes in gold coin and to purchase gold bullion at a fixed price. On several occasions when a monetary crisis made necessary a larger supply of notes than could be provided under the Act, the Bank was authorized to exceed its fixed fiduciary issue. Generally, the suspension of the Act was accompanied by an increase in the Bank's discount rate to 10 per cent. The Currency Act of 1928 placed the fixed fiduciary issue of the Bank of England at £260 million, and required the deposit of gold coin and bullion to the full amount of the additional issue. The Bank of England was authorized to suspend gold payments in September, 1931. The principle of the fixed fiduciary issue was also the basis for the note issue of the government of Canada, and the note issue of the Bank of Norway.

A monetary system with a fixed fiduciary issue acts in the same manner as tho the lawful money of the country consists entirely of gold coin and gold certificates. An export of gold is normally followed by a retirement of notes, and an import of gold by an issue of notes. The supply of lawful money reflects changes in the gold holdings of the country, which in turn are determined by international trade and international finance. The monetary system under these con-

ditions, as Bagehot suggested, is regulated almost automatically.¹ If, as many think, human judgment cannot be trusted in the management of money, the automatic feature of the fixed fiduciary issue is very desirable.

The objections to the regulation of the supply of lawful money by a limitation of the fiduciary issue are directed particularly to its automatic feature. It is not likely that any automatic regulation of the monetary system can provide proper variations in the supply of money. The English monetary system retained all the evils of a gold commodity system, particularly the inelasticity of the supply of money. A loss of gold for any reason required a contraction of money with its undesirable repercussionary effects on production and employment. It is not sufficient that the Bank Act could be and was suspended. A suspension was invariably preceded by a monetary crisis, for the Chancellor of the Exchequer did not permit a departure from the law until the need was manifest; and the suspension of the law placed a tremendous burden on business men, for it was nearly always accompanied by a bank rate of 10 per cent. It is worth noting that the repeated need for suspension of the Bank Act is in itself proof that this method of management is not adapted to the requirements of a great commercial country. Some degree of elasticity can undoubtedly be provided in the monetary

¹ Bagehot wrote: "For more than fifty years—from 1793 to 1844—it [the Bank of England] was said to be the 'manager' of the paper currency, and on that account many expected much good from it; others said it did great harm; others again that it could do neither good nor harm. But for the whole period there was an incessant and fierce discussion. That discussion was terminated by the Act of 1844. By that Act the currency managed itself; the entire working is automatic. The Bank of England plainly does not manage—cannot even be said to manage—the currency any more." *Lombard Street*, p. 161. Of course, even with a fixed fiduciary issue there is some room for management of the monetary system, altho the degree of management is very limited.

system while retaining the general features of the fixed fiduciary issue; and there can be no question that a relaxation of the more stringent provisions, under proper safeguards, will give England a far more satisfactory monetary system.

The most important method of regulating the supply of lawful money is that requiring the maintenance of a gold reserve proportional to the note issue. The required reserve generally varies from 30 to 50 per cent, altho smaller and larger reserve requirements are not unknown. The gold reserve required against notes issued by the central bank is 30 per cent in Germany, 35 per cent in France, 40 per cent in the United States, and 50 per cent in Sweden. As the required reserve approaches 100 per cent, the monetary system of a country tends to act like that of countries with a fixed fiduciary issue.

The provisions under which notes are supplied by the Federal Reserve Banks in the United States, and by the Reichsbank in Germany, are typical of most countries requiring the maintenance of a gold reserve proportional to the note issue. Upon deposit of gold certificates and eligible security, of which at least 40 per cent must be gold certificates, the Federal Reserve Banks are permitted to issue Federal Reserve notes, formerly redeemable in gold. In emergencies, notes may be issued in excess of the reserve upon the deposit of sufficient eligible security, and the payment of a graduated tax upon the excess issue. The reserve requirements and penalties may be set aside by the Federal Reserve Board in emergencies. In Germany, the Reichsbank is required to maintain a reserve against its notes of 30 per cent in gold and 10 per cent in claims for foreign money. In emergencies, the Reichsbank may permit its reserve to fall below the legal requirement and on this deficiency in the reserve, the Bank is required to pay a graduated tax.

The principal advantage of this method of managing the supply of money is the great leeway it permits the issuing authority. A given expansion of the note issue in the United States would require a reserve of only 40 per cent—in France 35 per cent, in Germany 30 per cent—while in England and in other countries with fixed fiduciary issues, the gold required for any given expansion in the supply of lawful money would be the full 100 per cent of the additional issue. Further, the provision for an excess issue upon the payment of a penalty that is not very large, but not so small as to induce frequent issues of excess notes, permits the expansion of the currency in emergencies without a change in the law or an authorization to disregard the law. If an excess issue provision is too lenient, and the provision is abused, a graduated scale of penalties generally brings about a correction. The most serious objection to the requirement of a proportional gold reserve is that it may make necessary a large and rapid contraction of the supply of lawful money when gold is exported. But this is true only if the gold reserve is close to the legal limit, and if the central bank is not willing to take advantage of the provision for an excess issue.

A method of regulating the supply of lawful money not widely used is that of fixing for the time being the maximum issue of notes. Redemption in gold may still be required, as well as the maintenance of a gold reserve. The device was commonly used in the United States. The total note issues of the first and second Bank of the United States were limited to their authorized capital which was fixed for the duration of the charters. When the national banking system was formed in 1863, the total issue of national bank notes was limited to \$300 million. This was increased on several occasions, and the limitation was entirely removed in 1875. The same principle was used to limit the supply of United

States notes, greenbacks, during and after the Civil War. The emergency currency of the Aldrich-Vreeland Act, 1908, was limited to a total of \$500 million. The permissive power granted to the President, in 1933, to issue United States notes under certain conditions for specified purposes also limited the total issue for these purposes to \$3,000 million. It is interesting to observe that the Continental Congress limited the maximum issue of continental currency, the first paper money issued by this country, to \$200 million.

The most important use of the fixed maximum issue as a means of regulating the supply of lawful money was by France prior to the enactment of the Monetary Law of June 25, 1928. The Bank of France was established in 1800 with the encouragement of the government. In 1803 it was made the sole bank of issue. The legitimist government in 1817 ended the monopoly of the note issue; but this was re-imposed by the revolutionary government of 1848. In that year the redemption of the notes of the Bank of France in gold was suspended, and a provision was placed in the law making the Bank's notes legal tender and fixing a maximum issue. The limitation was removed when specie payments were resumed in 1850. Because of the war, the redemption of notes was again suspended in 1870, and a limit was placed on the maximum issue of notes. From time to time this limit was raised, but not until 1928 was the restriction on the maximum issue of notes again removed. The Bank of France may now issue notes to any amount, provided it maintains a gold reserve of 35 per cent.

The chief advantage of this method of managing the quantity of lawful money is its great elasticity. The authorized maximum is generally much in excess of the actual issue, permitting a rapid expansion of the note issue when it be-

comes necessary. As the authorized maximum is approached, new legislation can be secured increasing the authorized note issue. The freeing of the monetary system from a required reserve of gold permits the managing of the supply of money without great disturbance from gold movements. The objections commonly made to this method of limiting the supply of money are that it offers too little resistance to undesirable expansion, and that by permitting gold reserves to become too low relative to the note issue it may lead to frequent suspension of gold payments. In fact, France has always maintained an unusually large gold reserve, and except for the period from 1914 to 1928, gold redemption has been maintained since 1877. The objection that a monetary system is insufficiently tied to gold cannot be considered conclusive, provided that it permits the management of money to maintain economic equilibrium.²

It has been suggested by some economists that the best method of regulating the supply of money would be to combine a limitation on the total note issue with a provision for a minimum gold reserve. The minimum gold reserve requirement is exceedingly rare, and a combination of the two provisions is entirely unknown. The Bank of Finland is required to keep a minimum gold reserve of 300 million marks; and in Sweden, the State Bank must maintain the gold reserve at not less than 150 million kronor. The United States is required by law to maintain a gold reserve of \$150 million against its notes—the greenbacks. Aside from these instances, no country provides for a minimum gold reserve, requiring

² Of course, the methods already considered do not exhaust the various devices that could be utilized for regulating the issue of lawful money. Jevons lists fourteen "methods according to which the amount of issue may be regulated." W. S. Jevons, *Money and the Mechanism of Exchange*, pp. 218-221.

instead a reserve varying with the amount of the note issue. The Macmillan Committee in its report, 1931, recommended that the Bank of England be required to maintain a minimum gold reserve—say, about £75 million—instead of requiring complete coverage for notes in excess of the fixed fiduciary issue as provided by the Act of 1928. It is likely that this principle will be included in the gold reserve laws of other countries in the future. As Hawtrey suggests, the gold standard does not require a reserve of gold sufficient to meet any flight from a currency, but only so much as will provide for the maximum contraction in the quantity of money that a country is likely to undertake without abandoning the gold standard. For the better management of a monetary system on the gold standard, he holds that “the dissociation of the gold reserve from the note issue would be a distinct gain.”³

The subsidiary and minor coins of a country are an important part of its lawful money. In general, the issue of such money is under the direct supervision of the government, as distinguished from the issue of notes which is generally under the supervision of central banks. Subsidiary and minor coins are invariably tokens—that is, they contain a quantity of metal worth considerably less than their nominal value. For this reason the coinage of such money is carried on only for government account. In some countries the treasury is required by law to place the profits of such coinage into a reserve for the redemption of fractional money, thus minimizing the possibility of excessive issue for the purpose of securing a profit. In the United States, the total quantity of fractional money was for a time limited to \$50 million. Few other restrictions are ordinarily placed on the issue of fractional money. In order to keep the supply of such money

³ R. G. Hawtrey, *The Art of Central Banking*, p. 259.

at approximately the amount needed by the community, the treasury or the central bank is required to maintain the inter-convertibility of lawful money and fractional money. To assure the return of excess coin to the treasury or the central bank in return for lawful money, the legal tender power of fractional money is generally limited.

3. *The Supply of Deposit Money*

Deposit money created by commercial banks, used in the form of checks drawn against demand deposits, is the largest part of the money supply of this country. The quantity of deposit money is limited by several factors, the most important of which are the legal requirements to convert deposits into lawful money on demand, and to maintain a reserve against deposits. The fact that member banks of the Federal Reserve system must keep their legal reserves with the Federal Reserve Banks, rather than in lawful money in their own vaults, limits the dependence of the supply of deposit money on the supply of lawful money. Properly speaking, all obligations of central banks should be regarded as lawful money; and in this sense, it can be said that the ultimate control of the quantity of deposit money rests with the central bank that provides the reserves of the banking system, whether in the form of lawful money or reserve deposits with the central bank.

No bank can continue in business unless it is prepared to convert its deposits into lawful money on the demand of its customers. Even doubt of a bank's capacity to pay on demand is sufficient to injure its reputation so much as to endanger its solvency, and to require liquidation. The process of converting a bank's assets into lawful money is expensive and unprofitable, and the loss to the owners of the bank, to

say nothing of the depositors, is likely to be large. A bank managed with a view to its profitability in the future as well as in the present will limit the supply of deposit money it makes available thru its loans, even tho this may result in a lowering of its immediate profits.

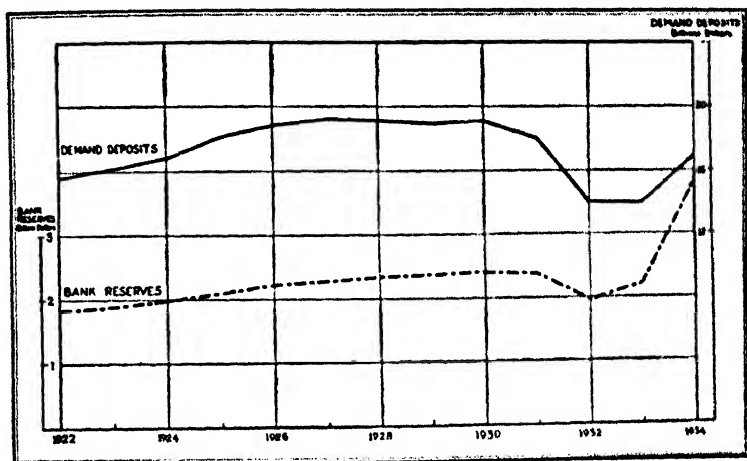
Bank Reserves and Demand Deposits, 1922 to 1934 *
(Millions of dollars)

Year	Demand Deposits	Bank Reserves
1922	15,539	1,835
1923	16,066	1,871
1924	16,838	1,965
1925	18,277	2,191
1926	18,804	2,236
1927	19,250	2,280
1928	19,191	2,342
1929	18,977	2,359
1930	19,170	2,408
1931	18,357	2,396
1932	14,482	1,998
1933	14,156	2,235
1934	16,988	3,820

* As of June 30th of each year. Demand deposits are net demand deposits of all members of Federal Reserve system; bank reserves are reserves of member banks with Federal Reserve Banks.

The community, and the competing and co-operating banks, set a standard of practice to which all banks must conform at the risk of losing business. This standard is the ratio of reserves to deposits, and the general liquidity of assets. A bank that persistently maintains a lower ratio of reserves to deposits than its competitors will probably find its business falling off relative to that of other banks. Unfor-

unately, the need for showing ratios of reserves to deposits as high as those maintained by competing banks has led some institutions to window-dress their statements by holding larger reserves than usual immediately before a statement is published. If a bank's liquidity comes to be questioned, its business will become less profitable because it will tend to



Bank Reserves and Demand Deposits
1922-1934

lose deposits and because its obligations will tend to be discounted at a higher rate than similar obligations of other banks. It is not only with the community that a bank must maintain its reputation; it is equally important and more difficult to maintain its reputation with competing and co-operating banks.

The banking laws of all states and of the United States now place restrictions on the quantity of deposit money that banks can make available. The restrictions on minimum capital, the nature of loans, and the amounts of individual loans, are all of some importance. The most effective restriction, however, is the requirement that banks must keep a legal

reserve on their deposits. Under the Federal Reserve Act the legal reserve of member banks—7, 10 and 13 per cent of demand deposits, depending upon the location of the bank—must be kept with the Federal Reserve Banks. This reserve can be replenished by a loan from the Federal Reserve Bank to the member bank, but as the Federal Reserve Banks must maintain a reserve of 35 per cent in gold certificates or in government money on reserves deposited with them, they in turn must restrict the reserves they make available to member banks. In addition to legal reserves, banks require a quantity of lawful money for current business needs—payments over the counter and adverse clearing balances. Directly or indirectly, these reserve requirements are the most important restriction on the supply of deposit money made available by commercial banks.

The customary and legal restrictions on deposit money are the ultimate limitation on the quantity of deposit money. But these restrictions, transmitted as they are thru a series of relationships—the community to the bank, the bank to the central bank and the law, the central bank to the law—are less rigid than they seem. Each relationship contains a small amount of elasticity, and the cumulative effect is to give to deposit money a rather large elasticity of supply. The community requires a normal ratio of reserves to deposits, and of lawful money to deposit money. These normal requirements are variable, being smaller in prosperous times than in periods of depression. This accounts for the tendency of deposit money to fall off during banking crises, altho bank reserves and lawful money are increasing at the same time. The reserves, deposits and lawful money are closely inter-related in our banking system. The volume of reserves made available by the central banks determines the maximum

amount of deposits that commercial banks can provide; and the deposits made available by commercial banks determine the quantity of lawful money the community will require.

It must not be assumed that because there is considerable dependence between the quantity of lawful money, bank reserves and deposit money, that the quantity of deposit money automatically adjusts itself to the other factors. Deposit money can come into existence only thru the making of loans by banks. If there is little demand for bank loans at the prevailing rate of discount, because business men cannot make profitable use of bank loans, the mere existence of a large volume of excess reserves will not result in the creation of a large quantity of deposit money. Similarly, if there is an unsatisfied demand for bank loans at the prevailing rate of discount, there are means by which banks, under certain conditions, can secure for themselves from the central bank sufficient reserves and lawful money to make possible an increase in their loans and in the quantity of deposit money. For this reason it must be noted that the condition of the market for bank loans will have a great influence on the quantity of deposit money.

It is sometimes said that savings deposits as well as demand deposits should be included in the quantity of money. It is undoubtedly true that many persons regard their savings deposits in much the same manner as others regard their demand deposits—as a supply of ready purchasing power to be used when needed. This is not the general attitude toward savings deposits. To most people they are in fact savings, not current income awaiting expenditure or investment. To the extent that savings deposits are used as a supply of ready purchasing power they must be included in the supply of money. At another point it will be shown that the frequency

with which money is used is an important factor in determining the price level. Savings deposits may be regarded as a supply of money with very small frequency of use. For most purposes they may be disregarded, for their total use for monetary purposes is relatively small. If it should become common to use savings deposits in much the same manner as demand deposits are now used, it will be necessary to include savings deposits in the total supply of money.

4. Money and Reserves

In nearly all monetary systems, the supply of money of all kinds is managed with reference to reserves. When the monetary authority of the country finds that reserves have become larger, there is a tendency for the supply of money to be increased; and conversely, when the reserves have become smaller, the supply of money tends to be decreased. In gold standard countries, reserves are synonymous with holdings of gold, for the banking reserves for deposit money as well as the supply of lawful money are dependent upon gold. The purposes of a gold reserve are to enable the monetary authority to maintain the value of money equal to that of a fixed quantity of gold, and to provide an objective means of determining whether the supply of money in the community is being maintained at a proper amount. Of these, the second purpose is of greater importance to the well-being of the community. Nevertheless, the effect of prevailing reserve laws has been to compel the monetary authority in gold standard countries to vary the supply of money for the purpose of maintaining the gold reserve at the level prescribed by law. Thus, unfortunately, the protection of the gold reserve has become the object of monetary management, and variation in the supply of money has become the means of attaining this end.

Such dependence of the monetary supply of a country on the gold holdings of the central bank and the government is very undesirable. In ordinary times, this is not apparent; but when a large outflow of gold makes necessary a contraction in the volume of money, and in the income and expenditure of the community, the hardships that follow from the action taken to protect the reserves become evident. There is no sound reason why the supply of money in a country should be made dependent on the magnitude of its gold reserves. The origin of the provision seems to be a deep distrust of the capacity of man to use good judgment in managing a monetary system. But even ordinary management would undoubtedly be superior to the automatic variations in the supply of money that result from regulating it with reference to gold reserves. There is no necessary relationship between the gold reserves and the community's need for money. The gold reserves of a country are determined by conditions of international trade, including local restrictions on the free movement of goods. These reserves are subject to change from external forces not related to the community's need for money. On the other hand, the volume of money that a community requires is determined by production and employment in its own country; and to make the volume of money conform to the available reserves is to bring about an unnecessary disturbance in production and employment.

To a large extent the supply of money in a country is dissociated from immediate dependence on gold by the device of maintaining free reserves. By holding a supply of gold in excess of the amount required by law, the monetary authority of a country may, for a time, maintain the volume of money at the amount necessary to permit maximum production and employment. But obviously, with the gold

standard, management of the supply of money independent of reserves cannot continue indefinitely. Eventually, a point may be reached at which the free reserves have been exhausted; and thereafter the supply of money must be made to conform to the legal reserves. For this reason, superior management of the monetary system requires complete dissociation of the supply of money from gold reserves. When this has been done it will be possible to regulate the volume of money to avoid large variations in the price level and to maintain production and employment on a satisfactory basis.

Chapter V

The Monetary System of the United States

1. *The Monetary System Before 1861*

THE monetary system of a country is the result of growth based on its economic needs, and on its political and historical antecedents. In the United States, these forces have given rise to an exceedingly complex monetary system. In no country in the world has the struggle over the monetary standard been carried on so long or so intensely.

Altho the American colonists brought English coins with them, they relied mainly upon money of their own. The wampum of the Indians, corn, cattle, furs, tobacco and rice, were all used as money in various parts of the country. Transactions were reckoned in shillings and pence, but where coins were used they were commonly of Spanish and Portuguese origin. To attract a supply of money, the colonies rated silver coin above its metallic value. The evils of competitive over-rating led Parliament to fix the maximum value of the Spanish dollar at six shillings, and to forbid the paying or receiving of dollars at any higher rate. "Prior to 1775 every one of the colonies had at one time or another made use of note issues, generally under government authority but in some cases emanating from private banking concerns."¹ The money depreciated rapidly, and forced conversion of old into new issues was common. By 1764, Parliament had for-

¹ A. B. Hepburn, *History of Coinage and Currency in the United States*, p. 53.

bidden the further issue of legal tender notes, first by the New England colonies, and later by all colonies. This regulation was opposed by the colonial governments, and it did much to rouse discontent with British rule.

The Revolution was financed by the issue of paper money, by domestic and foreign loans, and to a slight extent by taxes. Of the estimated total of approximately \$66 million in specie raised by the Continental Congress, more than 57 per cent came from forty issues of paper money. In 1779, the Continental Congress voted to limit the total circulation of continental currency to \$200 million, and no notes were issued after November of that year. The states also issued nearly \$210 million of paper money. The currency depreciated rapidly, particularly after 1779. The specie value of the continental dollar fell from one-eighth of a Spanish dollar in January, 1779, to one-hundredth of a Spanish dollar in 1781. In 1790, the continental currency was redeemed at 1 per cent of its nominal value. The indirect cost to the community of financing the Revolution in this manner was very great, but in the state of political affairs at the time, it would have been impossible to raise considerable revenue in any other way.

The Articles of Confederation gave to the United States a limited control over money, the states still being permitted the right of coinage. The Constitution remedied this by giving the right to coin money exclusively to Congress, and by forbidding the states to "coin money, emit bills of credit; make anything but gold and silver coin a tender in payment of debts."² These Constitutional provisions made possible a uniform monetary system. In 1791, Hamilton made an exhaustive report on money and coinage, and his recom-

² Article I, sect. 10.

mendations became the basis for the Mint Act of 1792. A monetary system was adopted with the dollar the unit of value, and with other coins in fractions and multiples of the unit. The standard gold coin was the eagle of ten dollars containing 247.5 grains of fine gold. The standard silver coin was the dollar containing 371.25 grains of fine silver. Full weight fractional silver coins were also to be minted. The act further provided for the free coinage of gold and silver, and the full legal tender power of gold and silver coins. The country was thus placed on a bimetallic standard, with the provision "that the proportional value of gold to silver in all coins . . . shall be as fifteen to one."³

Altho the mint ratio was in accord with the market ratio at the time, the difficulties of maintaining the circulation of both gold and silver soon became apparent. The silver dollars were exported to the West Indies where they replaced the heavier local coins; and after 1805, the coinage of silver dollars was halted. Coincident with this, the value of silver fell, and the fractional silver coinage increased relative to gold. Few eagles were coined, altho half- and quarter-eagles were minted to some extent. The need for the smaller gold pieces was great because the better banks did not issue notes in denominations of less than five dollars. But even the smaller gold coins could not be retained, for they were shipped to France and other European countries where their mint value, relative to silver, was higher. Except from 1814 to 1817 when specie payments were suspended, the country was virtually on a silver standard.

This situation was changed by the Act of June, 1834, reducing the content of the eagle to 232 grains of fine gold.

³ The provisions of the laws relating to money enacted before 1909 are taken from A. T. Huntington and R. J. Mawhinney, *Laws of the United States Concerning Money, Banking and Loans*, 1778-1909.

The mint ratio of gold to silver was thus fixed at slightly more than 16 to 1, at a time when the market ratio was about 15.7 to 1. The coinage of gold increased tremendously, while the coinage of silver declined. In the three-year period from 1834 to 1837 the coinage of gold was approximately equal to the coinage of silver, the best sustained record of gold coinage since 1805. In 1837, the coinage was again changed, this time to standardize the fine content of the coins. The proportion of fine metal in all gold and silver coins was fixed at nine-tenths. The gross weight of the silver dollar was decreased, but its fine content remained the same. The standard weight of the gold coins remained the same, but the fine content was increased from 23.2 to 23.22 grains per dollar. The ratio of the value of gold to silver at the mint was thus fixed at 15.98 to 1.

The act of 1834 undoubtedly over-valued gold, and this accounts for the increased gold coinage after that year. In the next decade, the great production of gold in Russia, California and Australia reduced the value of gold relative to silver, and led to the displacement of silver from circulation. The country experienced a shortage of small coin. In part this was overcome by the authorized coinage of gold dollars in 1849. The solution was finally found in the Act of February, 1853, by which the fine metal content of fractional silver coins was reduced by nearly one-third. Fractional silver money was to be coined only for the government, and its legal tender power was limited to five dollars.⁴ The free coinage of silver dollars was still permitted, but

⁴ The principles of subsidiary coinage—over-valued token coins with limited legal tender—were first recognized by the English Coinage Act of 1816. The legal tender power of a silver coin was first limited in this country by the Act of March, 1851, which authorized a silver 3-cent piece to be legal tender for payments not exceeding thirty cents.

with the undervaluation of silver at the mint, little was brought to be coined, and that little was used for export. The Act of 1853, wrote Laughlin, was a practical abandonment of the double standard in the United States.⁵ In the debates in Congress it was recognized that the country was in fact on a gold standard, and that the silver coinage was being adapted to that basis.

2. *The Banking System Before 1863*

The banking system of the United States began with the chartering of the Bank of North America by Congress in 1781, and of state banks by New York and Massachusetts soon after. In 1790, Hamilton proposed the establishment of a federal bank. It was vigorously opposed by the Jeffersonians, partly on economic, but chiefly on Constitutional grounds. Nevertheless, by the Act of February, 1791, the first Bank of the United States was chartered for twenty years. The act authorized a capital stock not to exceed \$10 million, of which one-fifth could be subscribed by the government. Subscriptions were payable one-fourth in specie and three-fourths in the public debt of the United States. The issue of bills or notes was permitted, limited to the capital of the Bank; and when redeemable in gold and silver coin, the notes were made receivable in all payments to the United States. No other bank was to be established by the federal government during the continuance of the charter. The head office of the Bank was established at Philadelphia, with seven branches in the country, and a branch at New Orleans. The Bank was useful to the government in making advances, and in keeping and transferring public funds. The charter expired in 1811 and was not renewed.

⁵ J. L. Laughlin, *History of Bimetallism in the United States*, p. 79.

The War of 1812 found the government hard-pressed for funds to carry on the war. Dependence was placed on loans raised in Philadelphia and New York; and treasury notes were issued, of which the smaller denominations circulated as money. The notes did not have legal tender power, but were receivable for public dues and were fundable into bonds. They circulated at par with coin until the general suspension of specie payments in August, 1814. The failure to re-charter the Bank of the United States handicapped the government during the war, and led to a disordered monetary system. State banks were formed in large numbers and they issued large quantities of notes. From 1814 to 1817, the loss to the government from poor and worthless bank notes was in excess of \$5 million.

The second Bank of the United States was chartered by Congress in April, 1816. It provided for a capital stock of \$35 million, of which one-fifth could be subscribed by the government. Subscriptions were payable one-fourth in gold or silver coin and not more than three-fourths in bonds of the United States. Five of the twenty-five directors were to be appointed by the President. The indebtedness of the Bank other than on deposits, virtually its note issue, was limited to the amount of its capital. The deposits of the government were to be kept with the Bank, unless the Secretary of the Treasury should direct otherwise, in which case the reasons must be given to Congress; and the Bank was to provide facilities for the transfer of public funds without charge. Specie payments were not to be suspended, with a penalty of 12 per cent annually added to all notes, bills, or obligations not redeemed in specie on demand. The charter also provided for a payment of \$1,500,000 by the Bank to the government in three annual instalments. Congress was given

power to inspect the books of the Bank, and the charter was to be forfeited for violation of the laws. During the term of the charter, no bank was to be established by Congress except in the District of Columbia.

The early history of the Bank was not creditable. The charter was violated, and business was carried on in a manner that endangered the solvency of the institution. In 1818, the Baltimore branch failed. Action was unsuccessfully begun to have Congress set aside the charter. The unpopularity of the Bank is indicated by the attempts to tax its business in Maryland and in Ohio, and in the frequently expressed doubt of its Constitutionality. From 1819 to 1823, a more conservative policy was followed. Circulation and loans were reduced, and the Bank was set upon a solvent basis. A period of moderately successful expansion was begun by the Bank in 1823.

Opposition to the Bank developed on economic and political grounds. The election of Jackson in 1828 brought the question actively into politics. In his message to Congress, December, 1829, Jackson questioned the Constitutionality and the desirability of the Bank. Committees of the House and Senate, after an investigation, reported favorably on its work. In January, 1832, a petition for a renewal of the charter was introduced and was favorably reported in Congress. The bill was passed in July, but it was vetoed by Jackson with a forceful message. After his re-election in 1832, Jackson began a more vigorous opposition to the Bank. Over the protests of two Secretaries of the Treasury, he ordered and secured the withdrawal of government funds. The legality of the transfer was challenged and bitterly debated in the Senate; but the government funds were not again deposited with the Bank. In 1836 the charter expired without being

renewed. The second Bank of the United States was converted into a state institution—it was granted a charter in Pennsylvania—but it never again attained national importance. In fact, it was soon insolvent. The funds of the federal government were kept in state banks meeting rather rigid requirements. In 1840, a system of independent treasuries was established.

In the early years of the second Bank of the United States, the number of state banks continued to grow, altho their note issues declined for a time. The difficulties of the Bank with the federal government, and the withdrawal of deposits, led to a large increase in the number of state banks and in their note issues. The most rapid expansion of state banks was in the decade from 1851 to 1860. The number of state banks doubled, and the note issues increased by more than 50 per cent. Most important was the improvement in the soundness of banking institutions in general. Altho there was still much wild-cat banking in the frontier sections of the country, a higher standard was prescribed by law in many states, particularly in New York, Massachusetts and Louisiana. But the growing number of banks, each with its private note issue, added unnecessary complexity to the monetary system. Banks owned in part by the state were formed in the South and West, and some, notably those of South Carolina and Indiana, were well managed. The Supreme Court first held their note issues to be unconstitutional; but the Court later reversed itself on the question.

3. *The Greenbacks and the National Banks*

In 1861, therefore, the country was on a gold basis in fact, with a token silver coinage of limited legal tender power, regulated by government. The paper money of the country was supplied by state banks, and altho there was much con-

fusion, fraud and counterfeiting, the situation was improving. The issue of small notes was declining, and the management of banks was better.

The Civil War changed the situation completely. It called for the raising of sums never before attempted in the country. In the early years of the war, the country relied on loans; but later, import and internal revenue duties were increased, and an income tax levied. From the point of view of monetary history, the greatest innovation was the issue of United States notes. The Act of July, 1861, permitted the Secretary of the Treasury to borrow not more than \$250 million within a year, part of the loan to be in the form of Treasury notes in denominations of five to fifty dollars, payable on demand, and exchangeable for interest bearing securities. The first large issue of government paper money was authorized by the Act of February, 1862, providing for \$150 million in United States notes, including the demand notes already issued, in denominations of not less than five dollars. The notes were made lawful money and legal tender for all debts public and private except import duties and interest on the public debt. By later acts in 1862 and 1863, the total authorized issue of greenbacks, in denominations of not less than one dollar, was increased to \$435 million.

The inefficient management of war loans forced the suspension of specie payments in December, 1861. The notes fell to a discount in coin immediately thereafter. The high and low discounts for each year of the war period were:

Year	Low Discount	High Discount
1862.....	January 2 per cent	December 24 per cent
1863.....	August 21 per cent	February 38 per cent
1864.....	January 36 per cent	July 61 per cent
1865.....	May 26 per cent	January 54 per cent

The depreciation of paper money in terms in specie led to a displacement of all coin, including fractional silver. The Act of July, 1862, authorized payment with stamps and forbade the private issue of notes for less than one dollar. An Act of March, 1863, authorized an issue of United States notes not to exceed \$50 million in fractional money, in lieu of the postage money then in use. After the war, the coinage of subsidiary silver was resumed, and the fractional notes were retired.

There was from the beginning some opposition to financing the war by means of paper money. The basis on which it was justified was the need of the funds for war purposes, and the difficulty of raising the money by loans and taxes. In all, some \$458 million in United States notes, including fractional money, were issued. At the close of the war there was a movement to reduce the outstanding greenbacks preparatory to the eventual resumption of specie payments. Various acts were passed regulating the retirement of United States notes. In 1878, the further reduction of outstanding notes was forbidden, the amount since then remaining at \$346 million. In 1875, the resumption of specie payments was set for January 1, 1879, and thereafter, until 1933, United States notes were convertible into gold.⁶ For a time there was agitation for further issues of greenbacks, but the struggle for cheaper money in this country took the form of a demand for the free coinage of silver.

⁶ To some extent gold was used throughout the period in which specie payments were suspended. In 1863, the Secretary of the Treasury was authorized to accept deposits of gold coin or bullion and to issue gold certificates payable on demand. In 1870, national gold banks were authorized to issue gold notes secured by United States bonds and by a reserve of 25 per cent in gold or silver coin. National gold notes were redeemable in gold coin on demand. In 1880, provision was made for converting gold banks into national banks.

The desire for a bank incorporated by the federal government did not end with the expiration of the charter of the second Bank of the United States. In 1841, two bills to establish a bank were passed by Congress, only to be vetoed by President Tyler. The chief economic objection to a nationally chartered bank was that it established a monopoly. This objection could be overcome by chartering many national banks; and this proposal was made on several occasions, in 1861 by Secretary of the Treasury Chase. It was argued that national banks would provide a uniform currency; that this currency could be made secure by requiring the deposit of government bonds for its issue; and that this requirement would open a new market for government securities.

The national banking system was established by the Acts of February, 1863, and June, 1864. These acts provided for the formation of national banks under the supervision of the Comptroller of the Currency. The banks were authorized to issue national currency—national bank notes—secured by the deposit of United States bonds, the issue to be limited to 90 per cent of the par or market value of the bonds, whichever was lower. Provision was made for the redemption and cancellation of national bank notes, for the maintenance of reserves against the notes and deposits of national banks, and for the regulation of the operations of the national banking system. The formation of national banks was stimulated by a tax of 10 per cent levied on state bank notes paid out after July 1, 1866, and by further provisions for the conversion of state into national banks. The total issue of national bank notes was limited to \$300 million in 1863 and 1864, and to \$354 million in 1870. In 1875 all restrictions on the total issue and its geographical apportionment were removed. In 1900, national banks were permitted to issue notes to the par

or market value of the bonds, whichever was lower, and to the full amount of their capital. In March, 1935, a plan to retire all national bank notes was announced.

4. *The Triumph of the Gold Standard*

The monetary system of the country was completely deranged by the Civil War. The elimination of state bank notes simplified the system, but the use of greenbacks and national bank notes added to the complexity. The depreciation of the currency had entirely eliminated the old coins; and the country was in need of a completely new coinage. The Act of February, 1873, provided for gold coins in denominations of one to twenty dollars, with a fine gold content of 23.22 grains to the dollar. The silver coins were to be a trade dollar of 378 grains of fine silver, and tokens for a half-dollar, quarter-dollar and dime. The silver coins were made legal tender at their nominal value in all payments not exceeding five dollars, later increased to ten dollars. Minor coins, legal tender to the amount of twenty-five cents, were also authorized. The free coinage of gold and of silver trade dollars was permitted, but the issue of token silver coins was to be only on government account. The old silver dollar was not in circulation, but its legal tender power was not affected by the Act of 1873. However, the Act of June, 1874, which provided that "the silver coins of the United States shall be a legal tender at their nominal value for any amount not exceeding five dollars in any one payment," applied to the old silver dollars as well as to the new trade dollars. As currency was still at a discount in terms of gold and silver, trade dollars were not used in domestic payments; and their legal tender power was entirely ended by the Act of July, 1876.

There was no opposition at the time to the removal of the dollar from the authorized coins and to the limitation of the legal tender power of silver, because the market price of silver was much higher than the mint price. After 1873 the market price of silver fell rapidly. In part this was due to the appreciation of the dollar as the resumption of specie payments approached, but largely it was the result of the decline in the gold value of silver. With a fall in the price level after 1873, a demand for the free coinage of silver was made by those favoring a higher price level, and by the silver mining interests. The question was compromised in the Act of February, 1878, the Bland-Allison Act. It provided for the resumption of the coinage of the silver dollar of 1837 on government account, and restored the full legal tender power to such dollars, including those coined under the earlier law. The Secretary of the Treasury was directed to purchase silver bullion at the market price to the extent of not less than \$2 million nor more than \$4 million per month. It also provided for the issue of silver certificates on the deposit of silver dollars. Under the act, the government purchased the minimum amount of silver, and from this coined \$352 million. From 1884 to 1890, the annual coinage of silver dollars exceeded the annual gold coinage.

The demand for the unlimited coinage of silver became greater as the price level continued to fall, and as the value of silver fell even more rapidly. Two additional compromise measures were intended to mollify this demand. The Act of March, 1887, ended the coinage of trade dollars, and provided that the trade dollars coined since 1873, for export use, could be recoined into legal tender dollars. More important was the Act of July, 1890, the Sherman Silver Purchase Act, providing for the purchase of 4,500,000 ounces of silver

monthly at not more than the mint price of 1837, \$1.29¼ an ounce. The silver was to be paid for with Treasury notes of 1890 which were to be redeemable in gold or silver, "it being the established policy of the United States to maintain the two metals on a parity with each other upon the present legal ratio, or such ratio as may be provided by law." Despite this, the Secretary of the Treasury followed the policy of redeeming all money in gold. The strain on the small gold reserve was too great, and the danger of a suspension of gold payments induced Congress, at a special session, to repeal the act, November 1, 1893, while affirming the bimetallic policy of the country. Nearly 200 million ounces of silver were purchased under the Sherman Act. The free coinage of silver was the issue in the presidential campaign of 1896, in which those advocating national bimetallism at the ratio of 16 to 1 were defeated. The single gold standard was formally adopted by the Act of March, 1900. It provided

That the dollar consisting of twenty-five and eight-tenths grains of gold nine-tenths fine [23.22 grains of fine gold], . . . shall be the standard unit of value, and all the forms of money issued or coined by the United States shall be maintained at a parity with this standard, and it shall be the duty of the Secretary of the Treasury to maintain such parity.

That nothing in this act shall be construed to affect the legal tender quality as now provided by law of the silver dollar, or of any other money coined or issued by the United States.

In effect, the Gold Standard Act provided for a limping gold standard. The act remained in force until the suspension of gold payments in 1933.

The silver question was thus settled for the time being; but within twenty years purchases of silver to raise the market price were resumed. In 1918, the Secretary of the

Treasury was authorized by the Pittman Act to melt and sell not in excess of 350 million silver dollars. The retired silver dollars and certificates were replaced by Federal Reserve bank notes secured by obligations of the United States, and the silver sold was later replaced by the purchase of domestically produced silver at \$1 an ounce. In 1933, an amendment to the Agricultural Adjustment Act authorized the President to put the country on a bimetallic standard by fixing the weight of the gold and silver dollar. The President was also authorized to accept silver in payment of foreign government debts up to \$200 million at a price not exceeding 50¢ an ounce; and some silver was acquired in this manner. In December, 1933, in accordance with the authority granted to him, the President authorized the mints to accept newly mined domestic silver for coinage at a seignorage of 50 per cent. In effect, the government undertook to purchase the silver at about 64½¢ an ounce. Finally, by the Silver Purchase Act of June, 1934, it was declared to be the policy of the country to maintain one-fourth of its metallic monetary stock in the form of silver; and the Secretary of the Treasury was directed to purchase silver to bring about this prescribed proportion. The President was authorized to require the delivery of domestic stocks of silver to be paid for at its monetary value less seignorage charges. Under the act, the President called for the delivery of domestic stocks of silver at a net price of about 50¢ an ounce; and purchases of silver have been undertaken abroad.

5. *The Monetary System Under the Federal Reserve Act*

Altho the gold standard had been established by law, it could not be said that the monetary system of the country was satisfactory. The principal weakness was that in time of

monetary stress there was no means by which an increased supply of lawful money could be secured. On several occasions, the clearing house associations had issued certificates of their own to provide a means of settling inter-bank debts. At other times, a stringency of lawful money in the banking system was relieved by the deposit of public funds in national banks. The financial difficulties of 1893 and 1907 made clear the necessity of a provision for supplying additional money in emergencies. The Act of May, 1908, was intended for this purpose. It provided that national banks, not less than ten in number, having an aggregate capital and surplus of \$5 million, could form national currency associations. In time of need, emergency currency not to exceed a total of \$500 million, secured by deposit of United States bonds, state and municipal bonds, and commercial paper, could be issued with the approval of the Secretary of the Treasury. To assure retirement of issues of emergency currency, the act provided for a tax graduated from 5 to 10 per cent on outstanding emergency notes, and for termination of its provisions on June 30, 1914, later extended to June 30, 1915. The act also provided for a National Monetary Commission of 18 members to inquire into and report to Congress on necessary or desirable changes in the monetary system of the United States.

The Commission made a detailed study of money and banking theory and practice; but its plan for the reformation of the banking and monetary system was not adopted. Instead, Congress passed the Federal Reserve Act of December, 1913. As amended, the act gives permanent charters to twelve Federal Reserve Banks in various cities, selected with a view to their economic and geographic convenience. The entire system is supervised by a Federal Reserve Board of eight

members of whom the Secretary of the Treasury and the Comptroller of the Currency are *ex-officio* members, the other six being chosen from different Federal Reserve districts to give a fair representation of the financial, agricultural, industrial, and commercial interests, and the geographical divisions of the country. The Board has general supervision of the Federal Reserve system. It interprets the various provisions of the act and sees that the law is obeyed. In cooperation with the Reserve Banks it formulates policies. It is authorized to permit or require the Reserve Banks to rediscount for each other; and under certain conditions to suspend the reserve requirements of the act. A Federal Reserve Advisory Council of twelve, one chosen from each district by the Reserve Banks, has the power to confer, to make recommendations, and to call for information on the work of the Federal Reserve system.

All national banks are required to become members of the Federal Reserve system, and state banks are permitted to become members upon compliance with the law. The capital of the Reserve Banks is furnished by member banks, who are required to subscribe to stock of the Federal Reserve Banks to the extent of 6 per cent of their paid-up capital and surplus. Only half of this 6 per cent subscription has been called for. Prior to 1933, the earnings of the Federal Reserve Banks were used to pay 6 per cent cumulative dividends on their paid-up capital, and after a surplus of 100 per cent had been accumulated, of earnings in excess of dividend requirements, 10 per cent was added to the surplus and the remainder paid to the government as a franchise tax. The Banking Act of June, 1933, now provides that the earnings of the Federal Reserve Banks in excess of their dividend requirements should be added to surplus. The Reserve Banks are managed

by a board of nine directors, three of whom are appointed by the Federal Reserve Board, and six, only three of whom may be bankers, are elected by the member banks.

The Federal Reserve Banks do business with banks and the federal government and under exceptional circumstances may make direct loans to industry. Their functions are to mobilize banking reserves, to provide an elastic currency, to manage the monetary system with a view to stabilizing prices, to collect checks at par, and to act as the fiscal agent of the federal government. The member banks are required to keep their legal reserves on deposit with the Federal Reserve Banks; and on these deposited reserves, the Federal Reserve Banks keep a reserve of 35 per cent in gold certificates or government money. The legal reserves of member banks are now fixed at 7, 10 or 13 per cent on demand deposits, depending upon the location of the bank, and 3 per cent on time deposits. The Federal Reserve Board may vary these reserve requirements in emergencies. If member banks require additional funds to replenish their reserves, the Federal Reserve Banks may make advances on their secured promissory notes or rediscount their loans. Any sound paper, the proceeds of which have been used or are to be used for a current industrial, commercial, or agricultural operation, and paper secured by United States bonds or treasury certificates are eligible for rediscount. The Federal Reserve Banks can issue Federal Reserve notes by depositing with the Federal Reserve agent gold certificates and eligible security to not less than the amount of the notes; and of this, not less than 40 per cent must be gold certificates. Federal Reserve notes are obligations of the government, and prior to March, 1933, they were redeemable in gold. The Federal Reserve Banks are authorized to buy and sell federal securities, municipal

warrants and bank acceptances; and these purchases and sales have been used to increase and decrease the reserves of the banking system with a view to controlling their volume of deposit money, and to affect the price level and business conditions.

The Federal Reserve system began operation soon after the outbreak of the great war. From 1917 to 1920, the policies of the system were determined almost exclusively with a view to facilitating the financing of the government's requirements for the war. With the aid of the Federal Reserve system, the government raised billions of dollars in loans from member banks and from the public. In these large financial operations the government experienced far less difficulty than it did in previous wars. It was not until 1920 that the Federal Reserve system could carry on its functions without regard to the financial needs of the government. In May, 1920, prices began to fall and continued to fall until June, 1920. There is evidence that many officials of the Federal Reserve system were of the opinion that the prices of 1920 were abnormal and could not be maintained. For this reason, nothing was done to prevent the fall in prices. From 1922 to 1928 the price level remained relatively stable. The successful management of the monetary system in these years led many to believe that it would be possible to avoid the more extreme fluctuations in business activity. Nevertheless, in 1929 the most severe depression in American history began, and as prices continued to fall, conditions grew steadily worse. The efforts of the Hoover administration to combat the depression by the formation of the National Credit Corporation and the Reconstruction Finance Corporation were unsuccessful. .

6. Monetary Management Since 1933

On March 4, 1933, the day he took office, President Roosevelt proclaimed the existence of a national emergency, and declared a national banking holiday. In the meantime, a special session of Congress passed the Emergency Banking Act, and it was approved by the President, March 9, 1933. The act gives the President the power to regulate dealings in gold and foreign exchange during a national emergency, and to require the conversion of gold and gold certificates into any form of money issued under the laws of the United States. Orders of the Treasury and of the President on several occasions thereafter required gold and gold certificates to be surrendered to the government in exchange for other forms of money. The act authorized the Comptroller of the Currency to appoint conservators of the assets of insolvent national banks for the benefit of depositors and creditors. To provide additional capital for banks, the Secretary of the Treasury was authorized to request the Reconstruction Finance Corporation to subscribe to the capital of banks; and this was done thru purchases of preferred stock and capital notes. The act provided for the issue of Federal Reserve bank notes during the emergency, secured by obligations of the United States, or by paper acquired under the provisions of the Federal Reserve Act. The lending powers of the Federal Reserve Banks were also extended for the emergency period. The act provided the means for resuming banking operations; and as banks were found to be in sound condition, they were permitted to re-open.

To bring about a rise in prices as an aid to recovery, an amendment to the Agricultural Adjustment Act of 1933 gave the President further control of the monetary system during the emergency. He may direct the Federal Reserve

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Board to permit the Federal Reserve Banks to carry on additional open market operations in the direct and indirect obligations of the United States up to \$3,000 million; and to exempt the Federal Reserve Banks from any penalty for a deficiency in their reserves brought on by these operations. If the Federal Reserve Banks refuse to act under this section, the President may direct the Secretary of the Treasury to issue United States notes, not to exceed \$3,000 million, to meet maturing obligations and to purchase bonds of the United States, 4 per cent of such notes to be retired annually. The Act also authorized the President to reduce the gold weight content of the dollar by not more than 50 per cent; and to put the country on a bimetallic standard by fixing the weight of the gold and silver dollar, and by permitting coinage of gold and silver at this ratio. The Federal Reserve Board was also authorized to increase or decrease the reserve requirements of member banks during the emergency. A joint resolution of Congress, June, 1933, provided that "to assure uniform value to the coins and currencies of the United States," all obligations, whether calling for payment in gold or in any particular form of money, could be discharged by payment of legal tender; and all metallic and paper money, including Federal Reserve notes and bank notes, and national bank notes, were made legal tender for all debts public and private. The resolution of June, 1933, abrogating the gold clause in contracts was substantially upheld by the Supreme Court on February 4, 1935.

The reform of the banking system was undertaken in the Banking Act of June, 1933. The lending operations of member banks were restricted to a large extent by this act. It forbids member banks to make loans or to extend credit in any manner to their executive officers; or to make loans to

or investments in affiliates. Member banks may not act as agents for non-banking organizations in placing loans on stock market collateral. The Federal Reserve Board may direct any member bank to refrain from increasing loans for speculative purposes; and after a warning, a violation may make the member bank ineligible as a borrower from the Federal Reserve Bank for a period determined by the Federal Reserve Board. Close ties between investment banking and deposit banking are forbidden by the Act of June, 1933. National banks may not engage in investment banking, altho they may buy and sell securities upon the order of their customers; and they may purchase securities for their own account under rules prescribed by the Comptroller of the Currency. Member banks may not be affiliated in any manner with an organization engaged in the securities business; and officers and directors of member banks may not act as officers or directors of a securities organization. After June 16, 1934, investment banks are forbidden to receive deposits.

An important feature of the Banking Act of 1933, amended June, 1934, is the creation of a Federal Deposit Insurance Corporation to which members of the Federal Reserve system must belong and to which non-member banks may belong until July 1, 1937. The capital for the Corporation is provided by the Treasury, the beneficiary banks, and the Federal Reserve Banks. The Corporation is given power to act as receiver for beneficiary banks unable to meet the demands of depositors. The Corporation may grant loans to closed banks or purchase the assets of such banks. It may issue obligations to the extent of three times its capital. An annual report of its operations must be made to Congress.

The Banking Act of 1933 also makes many changes of fundamental importance in the organization of the banking system. Membership in the Federal Reserve system is extended to industrial and savings banks. A Federal Open Market Committee is created to meet at least quarterly; and regulation of open market operations is given to the Federal Reserve Board. The term of office of members of the Federal Reserve Board is extended to twelve years. In electing directors for national banks, cumulative voting may be used. National banks formed after the act may issue shares free from double liability. There is also additional control over interest rates paid and charged by banks. The interest rate charged by national banks is limited. Member banks may not pay interest on demand deposits, except where required by state law; and the Federal Reserve Board may limit the interest rates on time deposits. The Act of June, 1934, gives the Federal Reserve Banks the right to make direct loans to industry in exceptional circumstances where financial assistance is not obtainable from usual sources.

The regulation of banking for the purpose of managing the monetary system is further extended in the proposed Banking Act of 1935. The government of the Federal Reserve Banks is changed by combining the offices of governor and chairman of the board of directors, the position of Federal Reserve agent being abolished. The greatest changes are made in the powers of the Federal Reserve Board. In selecting members of the Federal Reserve Board the President is required to choose persons well qualified by education or experience to participate in the formulation of national economic and monetary policies. It is proposed to establish a new Federal Open Market Committee consisting of the Governor and two members of the Federal Reserve

Board, and two governors of Federal Reserve Banks selected by the Reserve Banks. This Committee is to consider questions of policy and the Federal Reserve Banks are required to conduct their open market operations in conformity with these policies. The Committee may also make recommendations regarding the discount rates of Federal Reserve Banks. The bill gives the Federal Reserve Board the power to change the reserve requirements for all classes of member banks in all Federal Reserve districts, and requires the maintenance of reserves on government deposits. The policy of controlling the banking system to aid in the management of money is thus continued.

The inflation amendment to the Agricultural Act gave the President large discretionary power over the monetary system. In fact, only a few of the provisions of the amendment were used. After the suspension of gold payments in 1933, the foreign exchange value of the dollar fell rapidly. This was in accord with the administration's plans, and no effort was made to halt the decline. When Congress met in January, it became evident that the President was prepared to organize the monetary system on a permanent basis. His plan was embodied in the Gold Reserve Act of 1934. It provided that gold should no longer be coined, altho it could be put up in the form of bars of convenient size and of standard fineness. The gold holdings of the Federal Reserve Banks were to be turned over to the government in exchange for gold certificates not redeemable in a fixed quantity of gold, the certificates to be eligible for use as reserves for the issue of Federal Reserve notes. Transactions in gold could be carried on only under regulations prescribed by the Secretary of the Treasury. The gold content of the dollar was to be fixed by the President at not less than

50 per cent nor more than 60 per cent of the weight prescribed by the Gold Standard Act of March, 1900. The profit and loss from changes in the gold content of the dollar were to be accounted for in the general fund. To stabilize the exchange value of the dollar, the Secretary of the Treasury, with the approval of the President, may deal in gold and foreign exchange and other instruments of credit and securities; and an exchange stabilization fund of \$2,000 million was created for this purpose. The legislation was for a period of two years, and it could be extended to a third year by the President.

The manner in which the authority granted to the President was used in acquiring silver has already been stated. In October, 1933, the President directed the Reconstruction Finance Corporation to buy newly mined domestic gold at prices to be determined from time to time after consultation with the President and the Secretary of the Treasury. Gold purchases were begun the last week in October at a price of \$31.36 an ounce. Almost steadily thereafter the price was raised, until on January 16, 1934, it was \$34.45 an ounce. In the meantime, foreign gold was acquired at prevailing market prices, these prices depending, of course, on the foreign exchange value of the dollar. On January 31, 1934, acting under authority conferred by the acts of 1933 and 1934, the President fixed the weight of the dollar at 13 5/7 grains of fine gold, equivalent to a price of \$35 an ounce. The policy of depreciating the foreign exchange value of the dollar, of which the gold and silver purchases are a part, undoubtedly aided in the rise in the price level that took place after March, 1933.

The monetary and banking system of the country has been under the direct management of the President and the Secre-

tary of the Treasury since the banking crisis of March, 1933. In this period, the monetary system has been managed with the principal object of raising prices to a remunerative level and restoring economic equilibrium. No country in the world is in a better position than the United States to manage its monetary system for these purposes. In a radio address on October 22, 1933, President Roosevelt stated:

I repeat what I have said on many occasions, that ever since last March the definite policy of the government has been to restore commodity price levels.

The object has been the attainment of such a level as will enable agriculture and industry once more to give work to the unemployed.

It has been to make possible the payment of public and private debts more nearly at the price level at which they were incurred.

It has been gradually to restore a balance in the price structure so that farmers may exchange their products for the products of industry on a fairer exchange basis.

It has been and is also the purpose to prevent prices from rising beyond the point necessary to attain these ends. The permanent welfare and security of every class of our people ultimately depends on our attainment of these purposes.

The acts, orders and regulations since 1933 have been designed for the purpose of enabling the monetary authorities of the country to manage the monetary system to attain these ends. In some instances the means have been undesirable and have had unfortunate repercussionary effects. These objections will be considered with the particular monetary problems to which they are related. On the whole, however, the monetary changes since 1933 have been the necessary

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and desirable means of establishing a monetary system managed for the purpose of maintaining the proper production, distribution and utilization of the national income.

Circulation of United States Money—December 31, 1934 * (Thousands of dollars)

Kind of Money	Money in Treasury	Money in Reserve Banks	Money in Circulation
Gold	8,237,967		
Gold certificates	(4,343,017) ^a	800,396	130,393
Standard silver dollars..	508,355	3,140	32,047
Silver bullion	211,620	.....	.....
Silver certificates .....	.....	110,674	591,570
Treasury notes of 1890. ....	.....	.....	1,185
Subsidiary silver	4,171	10,881	294,380
Minor coin	2,646	2,761	125,101
United States notes	2,476	79,451	264,755
Federal Reserve notes..	16,989	327,760	3,175,617
Federal Reserve Bank notes	2,318	15,683	100,761
National bank notes....	21,885	46,189	819,863
Total, Dec. 31, 1934....	9,008,426	1,396,935 ^b	5,535,672 ^b

* Adapted from Report of the Treasury Department.

^a This amount is not included in the total because the money held in trust against gold certificates is included under gold bullion and coin. These gold certificates are held for Federal Reserve Banks and Agents.

^b Gold and silver certificates and Treasury notes of 1890 in Federal Reserve Banks and in circulation must be deducted from these amounts before combining with money in Treasury to obtain the total amount of money in the United States.

PART TWO

Prices

Chapter VI

Index Numbers of Prices

1. *The Measurement of the Value of Money*

THE concept of the value of money as its purchasing power over goods and services is of fundamental importance in monetary theory. The real value of a unit of money at a given time and place is the quantity of goods and services of all kinds that can be purchased with a unit of money. Obviously, the value of money will not be the same for people in different economic and social positions; for it will depend upon the kinds and relative quantities of goods and services that are purchased. For any one person, the average value of a unit of money is that fractional part of the goods and services he purchases for final use that one unit of money—say, a dollar—bears to his total expenditure on consumption. Thus, if a person spends twenty dollars during one week, the average value of a dollar to that person for that week is one-twentieth of all the goods and services of various kinds that were purchased for consumption with that twenty dollars. Similarly, the average value of a unit of money in a community during a given period is that fractional part of all the goods and services purchased for final use that one dollar bears to the community's total expenditure on consumption. If the total expenditure of the people of the United States on consumption was \$50,000 million in 1934, the average value of a dollar in 1934 was one fifty-billionth of all the goods and services that were purchased for consumption in that year.

It is possible in this way to find the absolute purchasing power of a unit of money at any time and place. However, the value of money expressed in this form would not be very useful for most purposes. In the first place, it would include infinitesimal quantities of many thousands of goods and services, most of them of little importance. Under ordinary conditions, it is inconvenient to make use of so complex a collection of different items. In the second place, it would be difficult to compare the value of money at one time or place with the value of money at another time or place, for the quantities of goods and services of various kinds purchased with a unit of money are not in the same relative proportions at different times or places. Without a great deal of study there is no way to determine whether the increased quantities of some commodities that are purchased with a unit of money at one time or place are offset by the decreased quantities of other commodities that are purchased at another time or place. This is further complicated by the disappearance of some goods from consumption, and by the addition of new goods from time to time. On the whole, the measurement of the absolute value of a unit of money is so difficult, and its interpretation so complex, as to be of little use for most purposes.

A useful measure of the value of money must be simple, and it must state the resultant of the divergent purchasing power of money over the various goods and services purchased for final use. This cannot be done very well for the absolute value of money; but it can be done for the relative value of money at different times or in different places. In studying the effect of the value of money on economic equilibrium, it is generally more desirable to use the relative value of money—that is, indications of changes in its value—

so that the difficulty of finding the absolute value of money is not of great importance. As ordinarily understood, the value of money is the reciprocal of the prices of the goods and services consumed by the community; and changes in the value of money are indicated by changes in these prices. It would be very difficult to find the average change in the prices of the many thousands of goods and services that are purchased. For most purposes, it is satisfactory to find the average change in the prices of the more important goods, which may be regarded as samples of all the goods consumed by the community. There is no great error in determining the relative value of money from the prices of a limited number of goods, because, in general, the goods so chosen account for the greater part of the consumption of the community, and the changes in the prices of these goods are typical of the changes in the prices of all goods. The device for finding the relative value of money from the prices of a collection of a limited number of the most important goods is called an index number of prices. It indicates the average percentage ratio that the prices of a collection of goods and services at one time or place bears to the prices of the same collection at another time or place.

2. *The Uses of Index Numbers of Prices*

"The general price level is not a given, self-evident fact, but a theoretical abstraction. It is a scientific tool which has to serve for certain scientific and practical purposes. . . . An economically relevant definition of price level cannot be independent of the purpose in mind, and for each purpose a separate index number must be computed." ¹ In making use of an index number of prices—that is, an indication of the

¹ Gottfried Haberler, "The Meaning and Use of a General Price Index," *Quarterly Journal of Economics*, May, 1928, pp. 435-436.

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relative value of money—it is essential to have a clear understanding of the purpose for which the index number is computed. The following are some of the more important purposes for which index numbers of prices may be used:

- (1. For determining the relationship between the quantity of money and the level of prices.
2. For determining the effect of changes in the level of prices on the volume of production.
3. For determining the effect of changes in prices on the well-being of economic groups: laborers, farmers, debtors, etc.)

Index numbers of prices have been used for other purposes, but the more important ones have been devised for these purposes. Altho the use of index numbers of prices has long been known, they have not been much used by business men and statesmen as guides to economic policy.

Various types of index numbers of prices that can be used for the above purposes have been constructed. Carl Snyder of the Federal Reserve Bank of New York has combined twelve individual index numbers of prices to give what he calls an index of the "general price level." In constructing his index number of prices, Snyder made use of the following index numbers of prices of particular kinds of commodities: industrial commodity prices at wholesale, farm prices at the farm, retail food prices, rents, other cost of living items, transportation costs, realty values, security prices, equipment and machinery prices, hardware prices, automobile prices, and composite wages.² Snyder's index number of the general price level takes account of all important purposes for which money is paid out, and there-

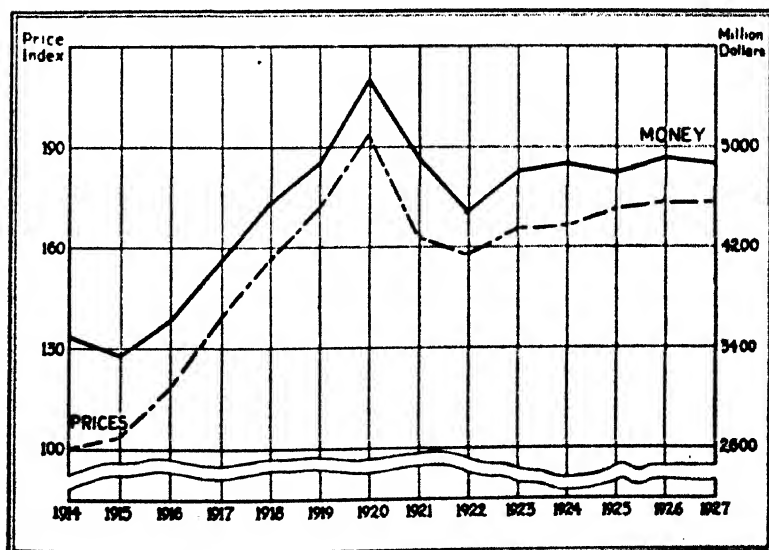
² Carl Snyder, "The Measure of the General Price Level," *Review of Economic Statistics*, February, 1928, pp. 40-52.

fore shows close correlation with the quantity of money. It is particularly useful for the first purpose—to show the relationship between the quantity of money and the level

Snyder's Index Number of General Prices and Money in Circulation

Year	Price Index*	Money in Circulation	Year	Price Index*	Money in Circulation
1914....	100	\$3,459 million	1921....	163	\$4,911 million
1915....	103	3,320 "	1922....	158	4,463 "
1916....	117	3,649 "	1923....	165	4,823 "
1917....	139	4,066 "	1924....	166	4,849 "
1918....	157	4,482 "	1925....	170	4,815 "
1919....	173	4,877 "	1926....	171	4,885 "
1920....	193	5,468 "	1927....	171	4,851 "

* 1913 = 100. *Review of Economic Statistics*, February, 1928.



General Prices and Money in Circulation
1914-1927

of prices. However, it cannot be considered a satisfactory index for determining the value of money in purchasing goods and services for consumption. For this reason it differs considerably from index numbers of wholesale prices and of the cost of living.

The index number of wholesale prices is undoubtedly the most commonly used of all index numbers of prices. An index number of wholesale prices does not indicate the changes in the purchasing power of money over the final goods and services that constitute the real income of the community. But this index number of prices is exceedingly useful in indicating the effect of a change in the price level on the volume of production. It has been well established that the volume of production is related to the profitability of business: a rise in profits calling forth an expansion of production, and a fall in profits a contraction of production. The profitability of business depends upon the prices received by business men—wholesale prices of manufactured and semi-manufactured goods—and the expenses of production. If the efficiency of production remains the same, a change in the relationship of the index number of wholesale prices to the index number of expenses of production—prices of raw materials, wages, industrial rents, interest rates, and taxes—would indicate a change in the profitability of business and an expectation of a change in the volume of production. In actual experience, the expenses of production for a given volume of output do not change rapidly, and a change in the wholesale prices of manufactured and semi-manufactured goods is likely to indicate a similar change in industrial profits, and prospectively in industrial production.

The value of money is the reciprocal of the prices of the goods and services purchased for final use. An index number

Index Numbers of Prices

Wholesale Prices and the Volume of Production

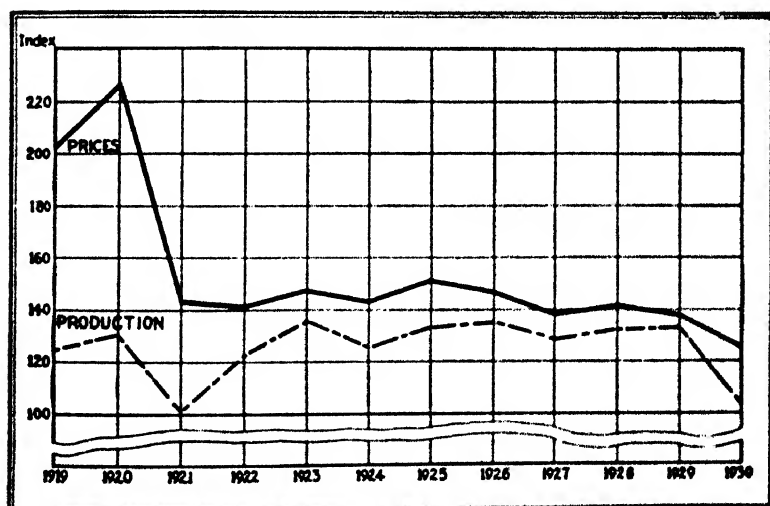
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Year	Price Index*	Corrected***		Year	Price Index*	Corrected***	
		Prod'n Index**	Prod'n Index			Prod'n Index**	Prod'n Index
1919...	202	123.6	123.6	1925...	151	151.7	134.7
1920...	226	133.1	130.5	1926...	146	155.5	135.4
1921...	143	105.7	101.6	1927...	139	152.5	130.2
1922...	141	130.0	122.5	1928...	141	158.7	132.8
1923...	147	148.7	137.4	1929...	139	163.5	134.2
1924...	143	139.6	126.4	1930...	126	136.4	108.1

* 1910-1914 = 100.

** 1909-1913 = 100. W. M. Persons, *Business Forecasting*.

*** Corrected for a trend of 2 per cent increase annually.



Wholesale Prices and Volume of Production
1919-1930

of prices for determining the value of money ought to be based on retail prices of consumption goods. Unfortunately, there are no reliable statistics of the final goods and services purchased by the community, and of the prices at which

they are purchased. It is partly for this reason that the index number of wholesale prices is so frequently used as a measure of the purchasing power of money. It has been argued that changes in the index number of wholesale prices are indicative of the same or similar changes in retail prices. Nevertheless, this is not sufficient reason for regarding wholesale prices as a measure of the value of money. First, wholesale prices do not include many of the things purchased at retail, such as housing, utility services, domestic and professional services. Second, retail prices are less variable in short periods than wholesale prices, so that in periods of rapid change, the index number of wholesale prices exaggerates the changes in the purchasing power of money over the goods and services used in consumption. For measuring changes in the well-being of economic groups in the community, the index number of wholesale prices cannot be regarded as an adequate substitute for index numbers of retail prices.

The most satisfactory index numbers that make use of the retail prices of consumption goods are those for the cost of living, generally of working class families, at various places. These index numbers can be used in measuring changes in the well-being of fully employed laborers by comparing money earnings and the cost of living. The well-being of workers is measured by changes in their real earnings, that is, in the ratio of the index number of earnings to the index number of the cost of living.

These three types of index numbers of prices measure the value of money for different purposes. An index of the general price level, making use of rents, realty and security values, as well as retail and wholesale prices, and wages, is a measure of the transaction value of money—its usefulness in monetary transactions of all kinds. It indicates the quan-

Index Numbers of Prices

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Weekly Earnings and the Cost of Living*

Quarter	Year	Index of Weekly Earnings	Index of Cost of Living	Index of Real Earnings
1st Quarter, 1925.....		216	165.9	130
2nd Quarter, 1925.....		214	165.7	129
3rd Quarter, 1925.....		212	168.5	126
4th Quarter, 1925.....		217	171.0	127
1st Quarter, 1926.....		218	169.4	129
2nd Quarter, 1926.....		216	168.0	129
3rd Quarter, 1926.....		216	166.0	130
4th Quarter, 1926.....		218	167.9	130
1st Quarter, 1927.....		219	165.4	132
2nd Quarter, 1927.....		219	164.1	133
3rd Quarter, 1927.....		216	162.3	133
4th Quarter, 1927.....		215	163.8	131
1st Quarter, 1928.....		219	161.9	135
2nd Quarter, 1928.....		218	161.1	135
3rd Quarter, 1928.....		219	162.0	135
4th Quarter, 1928.....		213	162.5	131
1st Quarter, 1929.....		227	160.6	141
2nd Quarter, 1929.....		227	159.6	142
3rd Quarter, 1929.....		226	162.6	139
4th Quarter, 1929.....		222	162.8	136
1st Quarter, 1930.....		217	158.9	137
2nd Quarter, 1930.....		211	156.2	135
3rd Quarter, 1930.....		198	152.3	130
4th Quarter, 1930.....		190	149.8	127

* National Industrial Conference Board, *Wages in the United States*, 1914-1930. July, 1914=100.

tity of money the community requires to carry on its transactions at the prevailing general price level. The index number of wholesale prices is generally regarded as a measure of the purchasing power of money—its command over real resources. Because of the omission of services of various kinds, and because prices are paid by merchants not consumers, the index number of wholesale prices cannot be accepted as a satisfactory measure of the value of money. More properly, it is an index of the prices received by producers, that is, of the capacity of money to purchase the output of business men. The value of money in securing real income, the goods and services purchased for final use, can be measured only by an index number of the cost of living. The purchasing power of money is its consumption value; and the appropriate index number of prices for measuring the value of money is the index number of the cost of living. This varies for every group in the community. It would, however, be possible to construct an index number of the cost of living for a representative family, and this could be regarded as an indication of the average value of money in the community.

3. The Collection of Data

Because index numbers of prices can be used for various purposes, the construction of a satisfactory index number depends upon the purpose for which variations in the price level are to be measured. The following are among the more important mechanical problems in constructing an index number of prices:

- (1. The selection of a suitable base year from which to measure variations in the price level;

2. The selection of an appropriate collection of goods and services;
3. The determination of the prices of the goods included in the collection;
4. The determination of the relative importance of each of the different goods and services included in the collection, that is, weighting;
5. The selection of the formula most suitable for the index number of prices to be constructed.)

These problems must be considered together because they are closely related, and affect each other. The selection of a collection of commodities, or of the base year, for example, may depend upon the information available on prices and quantities of various goods and services purchased in particular years.

In measuring the relative value of money in different places—say, New York and Chicago—there is no need for a base year. But in measuring the relative value of money at different times, the choice of a base—the period relative to which the price level at a given time is to be measured—is very important. The first requirement is that the year be normal. It must not be a year of unusual prosperity or depression, but a period of normal business activity. The year 1920 would be entirely unsatisfactory as a basis from which to measure changes in the price levels of other years. Professor Bowley and other distinguished statisticians recommend that a broad base, an average of years, be used to avoid abnormality. Where the average prices of several years are used as the base, the period over which the average is taken should not be too long. A five-year average is probably the ideal base for an index number of prices that is to extend over many years. Finally, in choosing a base it is desirable to use

a comparatively recent period. Partly for this reason the index number of wholesale prices constructed by the United States Bureau of Labor Statistics was converted from the base period before the war to the base year 1926. One of the objections to the English index numbers with a continuous history of many years is that the base period is too far back—it is 1867-77 for *The Statist's* index number and 1900 for *The Economist's*, the base 1845-1850 having been converted in 1911. Since continuity can be secured by various devices when the base period is advanced from time to time, there is no valid reason for retaining a base period too far back.)

It is important to exercise care in selecting the collection of commodities to be used in constructing the index number of prices. To determine the consumption value of money it is necessary to include all goods and services consumed by the representative family that are of significance in the expenditure of income. It is, of course, impossible to include every good and service purchased, for the index number of prices would then include tens of thousands of items in its collection. An index number of prices is constructed from selected samples of all goods and services consumed; and it is quite sufficient if these samples include all important commodities. In determining the consumption value of money, the collection of goods for which the index numbers of prices is found should include not less than 75 per cent of the real income of the representative family.

The collection of commodities, altho only a sample of all goods and services for which the average change in prices is to be measured, should be large as well as typical. Professor W. C. Mitchell used 1474 commodities in determining the index number of wholesale prices for the War Industries

Board. The Bureau of Labor Statistics uses 784 commodities in constructing its index number of wholesale prices. On the other hand, *The Economist's* index number of wholesale prices in England is based on only 44 commodities. This is probably too small a collection for an index number of this type. The index number of retail food prices of the Bureau of Labor Statistics included 30 commodities in 1907, 15 commodities from 1908 to 1912, 22 commodities from 1913 to 1920, and it has included 43 commodities since 1921. For its limited purpose—to measure changes in the average prices of food at retail—a collection of 43 commodities is probably sufficient. Altho a more inclusive collection tends to result in a more precise index number of prices, the increase in accuracy becomes less significant as the collection is enlarged; and the added precision to be gained from enlarging a collection of, say, 250 commodities is comparatively slight.

If satisfactory data are not available for the commodities most appropriate to an index number of prices, it may be necessary to select other commodities, altho the substitution diminishes the accuracy of the result. One particularly difficult problem is to make allowance for commodities not common to the periods or places for which the relative value of money is to be determined. J. M. Keynes has suggested that if the commodities common to both periods or places are a large part of the representative collection, no great error will result from entirely neglecting the commodities peculiar to each period or place. Alfred Marshall suggested that since commodities appear and disappear gradually, the representative collections of two consecutive years will not differ materially. The value of money for two dissimilar periods far apart is best compared indirectly, each year with its succeeding year, until the value of money at one period

is found relative to the value of money at the other period. This device, the chain method of constructing index numbers, will be illustrated below.

One great difficulty in constructing an index number of prices—particularly of retail prices—is to secure satisfactory price quotations. Some information can be obtained from the sales records of department and chain stores, and from newspaper advertisements; but this information is not reliable because goods with similar names are not always the same at different times or places. It is for this reason that many index numbers of prices make use of the prices of the staple commodities sold on important markets or exchanges. Graded cotton or wheat is the same commodity under all conditions, and the prices for wheat or cotton of the same grade are comparable, regardless of how far apart are the times or places for which quotations are taken. The popularity of the index number of wholesale prices is largely attributable to the ease with which satisfactory price quotations can be secured, and the certainty that the quotations are comparable.

The problem of weighting the commodities included in the collection is not so difficult as is commonly supposed. Professor Bowley thinks that ("if the number of independent quantities is at all considerable, any reasonable system of weights is likely to give as good a result as the conditions of the problem allow.") Altho this is probably too lenient a view, there is a great element of truth in it. Where no allowance is made for differences in the importance of commodities, the index number of prices is said to be *simple* or *unweighted*. In fact, there is no escaping the problem of weighting, for an unweighted index number is one in which all commodities are weighted equally. A common method

of weighting is to apply an arbitrary weight to each commodity on the basis of a judgment as to its relative importance. This is probably what Professor Slichter has in mind when he says that "weighting introduces bias into index numbers." But the bias of weights based upon sound judgment is certain to be less than the haphazard bias of an unweighted index number. The best method of weighting is on the basis of the relative total market values of the commodities in the collection. The total market values bear a different relationship to each other in different years, and it is therefore necessary to determine which of the various weights to use. Generally, there is no particular reason for preferring any year; and it is therefore best to use the average of the quantities of both years—the base and given years—in the index number.

4. *The Choice of a Formula*

When all the data have been secured they must be combined in some way that will show the average percentage ratio of the two series of prices for the collection of commodities under consideration. Professor Fisher tested 134 formulas, and found no great differences in the results secured from applying the more satisfactory formulas.³ The choice of a formula will therefore depend upon the degree of accuracy desired, and the care that can be given to the construction of the index number of prices. The most important fundamental types of index numbers of prices are the arithmetic mean, the geometric mean, the median and the aggregative mean, all of which can be weighted and crossed to give greater accuracy.

The most commonly used formula for index numbers is

³ I. Fisher, *The Making of Index Numbers*.

the arithmetic mean. Nearly all the more important index numbers of prices that go back before 1900—including those of *The Economist* and *The Statist*—are based on this formula.

(The arithmetic mean index number of prices is the average of the price relatives of the given year—a price relative being defined as the percentage ratio of the price of a good in a given year to its price in the base year.⁴) The reasons generally advanced for using the arithmetic mean are that it is a true average and that it is simple to construct. Its wide use is undoubtedly the result of the simplicity of its construction and the general familiarity of averages of this type. The arithmetic mean is much less commonly used in this country than in England; and it is seldom used when precision in the computations is required. The accuracy of the arithmetic mean can be increased to some extent by the use of weights proportional to the total market value of the commodities in the collection.

Altho the simple arithmetic mean is the most commonly used formula for index numbers of prices, it is not entirely satisfactory. Aside from the bias introduced by omitting weighting, the use of the simple arithmetic mean tends, invariably, to result in an index number of prices somewhat higher than is found by the use of other formulas. The reason for this upward bias is that a price relative can fall only to zero, altho it can rise to any number. An arithmetic aver-

⁴ The equation for the price relative of a commodity is $R = 100 \frac{p_1}{p_0}$

where R is the price relative, p_1 is the price of a good in the given year, and p_0 is the price of the same good in the base year. The equation for the simple arithmetic mean index number of prices is $I = \frac{\Sigma (R)}{n}$, where I is

the index number, $\Sigma (R)$ is the sum of the price relatives and n is the number of price relatives. The construction of this index number is illustrated in the note at the end of the chapter.

age of price relatives therefore tends to exaggerate the importance of a rise in price. Altho the use of the weighted arithmetic mean eliminates the bias involved in regarding all commodities as equally important, it does not eliminate the upward bias characteristic of arithmetic averages. In general, the weighted arithmetic mean tends to be lower than the simple arithmetic mean, for there is a tendency to increase the use of goods with a lower relative price; and the use of weights makes an allowance for this tendency.⁵

An index number formula that has been highly commended by many statisticians is the geometric mean. Its first important use was by Jevons in his computations of index numbers of prices. It is not often used in modern index numbers, altho it is still highly regarded. The geometric mean index number of prices is the geometric average of the price relatives of the given year—the n th root of the product of the n price relatives.⁶ In this manner the geometric mean avoids the exaggerated importance given to a rise in price in the index numbers that use arithmetic averages. It is sometimes said that the geometric mean has downward bias because a small fall in price counterbalances a large rise in price. In fact, this gives recognition to the tendency to extend the use of things that have fallen in relative price, and to contract the use of things that have risen in relative price. Whatever bias there is in the geometric mean comes from an ex-

⁵ The harmonic mean index number is a variation of the arithmetic mean that is occasionally used. It is found by taking the reciprocal of the arithmetic average of the reciprocals of the price relatives. The index number of prices by the harmonic mean is invariably lower than the index number found by the arithmetic mean.

⁶ The equation for the geometric mean index number of prices is $I = \sqrt[n]{R_1 \cdot R_2 \cdot \dots \cdot R_n}$ where I is the index number, the R 's are the price relatives, and n is the number of price relatives. The construction of this index number of prices is illustrated in the note at the end of the chapter.

aggregation of the tendency to vary purchases with changes in relative price. It is sometimes objected that the geometric mean is not an average in the accepted meaning of the term. This objection cannot be regarded as of any importance, for as Professor Taussig says, "It has quite as good a right to be entitled a 'true' average as the arithmetic." By the use of logarithms the geometric mean index number of prices can be found without difficulty, for it is the anti-logarithm of the average of the logarithms of the price relatives of the given year. The geometric mean can be weighted to give each of the commodities the importance it has in actual expenditure.

A type of index number formula that has been given wide approval is the median. This method of computing the index number of prices has been used by Edgeworth, Mitchell and Bowley. (The index number of prices by this method is the middle term of the price relatives arrayed in the order of their magnitude.) The ease of computation would make the median particularly desirable if it were free from bias. Bowley says, "It is perhaps impossible to show theoretically that any other average satisfies the required conditions better than the median, if a sufficient number of items are included." When put to the test of measuring actual price movements, the median reveals a slight downward bias in short periods following the inception of price movements. When the general level of prices rises immediately after business recovery, the rise is largely due to the movement of a few leading commodities, the greater number of goods remaining constant or rising little in price. The median tends

¹ The index number of prices, using the median, is the price relative $R \frac{n+1}{2}$ where R is the price relative and $\frac{n+1}{2}$ is its position in the array. The construction of this index number is illustrated in the note at the end of the chapter.

to underestimate the importance of the commodities that have risen in price, and to give a slightly lower index number than is given by other formulas. Similarly, where a general fall in prices sets in immediately after a business recession, the prices of regulated and monopolized goods tend to remain nearly constant in price for a time, and the median indicates a larger fall in the price level than is shown by other formulas. The great objection to the median, according to Fisher, is its sluggishness. In the short run it reflects the change in prices for the larger number of goods in the collection, not the average change in prices for the collection of goods. In the long run the bias is minimized and disappears. The median can be weighted in the same manner as the arithmetic and the geometric means.⁸

The most important index numbers of prices constructed in this country are based on aggregative formulas. The index number of wholesale prices of the Bureau of Labor Statistics is the best known of the many index numbers of this type. The aggregative index number of prices is the percentage ratio that the total cost of purchasing a collection of goods at one time or place bears to the total cost of purchasing the same collection at another time or place.⁹ The most important problem in computing an aggregative index number of prices is the choice of the quantities in the collection. There is no reason for preferring the quantities of either the base or given year. Nevertheless, it is not a matter of indif-

⁸ The mode is a method of finding the index number of prices that resembles the median. The index number by this method is the commonest price relative; or where an interval is used, that interval in which the largest number of price relatives lies. The weighted mode can also be used.

⁹ The equation for the aggregative index number is $I = 100 \frac{\sum p_1 q}{\sum p_0 q}$ where I is the index number, p_0 and p_1 are the prices of the base and given years, and q is the quantities in the collection. The construction of this index number is illustrated in the note at the end of the chapter.

ference which quantities are chosen, for if the quantities of the base year are chosen, the index number will frequently have an upward bias, and if the quantities of the given year are chosen, the index number will frequently have a downward bias. (The reason for this is that a rise in the relative price of a good tends to bring about a decrease in the consumption of that good; and conversely, a fall in the relative price of a good tends to bring about an increase in the consumption of that good.) It follows that if the quantities of the base year are used, they will tend to be relatively larger for the goods relatively low in price in the base year and relatively high in price in the given year. The best method of choosing the quantities is to use an average of the base and given years. This method was approved by Marshall, Edgeworth and Fisher. Altho the aggregative index number requires much computation, the greater accuracy warrants its use.

All the fundamental types of index numbers of prices can be crossed and combined in various ways to eliminate the bias resulting from the choice of the collection of one year rather than another. The chain method of constructing an index number of prices, introduced by Alfred Marshall, is an ingenious device for minimizing the effect on the index number of differences in the collection of commodities in the base and given years. By this method the index number of prices for any given year on a base year is found indirectly, by determining the index numbers of prices for each of the intervening years on the base of the previous year, using the collections of the previous years. The product of these link index numbers is the index number of prices for the given year relative to the base year. For example, to find the index number of prices for 1917 on the base 1913, it is necessary

to find the index number for 1914 on the base 1913, the index number for 1915 on the base 1914, the index number for 1916 on the base 1915, and the index number for 1917 on the base 1916. Assume that the index numbers of prices for these years, found in this manner, are 96 for 1914, 102 for 1915, 128 for 1916, and 140 for 1917. Then the index number for 1917 on the base 1913 by the chain method is $100 \times .96 \times 1.02 \times 1.28 \times 1.40 = 175.4$. The chain method is most appropriate where large changes have taken place in the typical collections for the base and given years.

5. *The Interpretation of Index Numbers.*

The difficulties in the construction of a satisfactory index number of prices are great and numerous, for not only is the meaning of the concept of a price level obscure, but there is a difference of opinion as to what it signifies and how it can be ascertained. Some of these errors are independent, and tend to cancel each other; but many are cumulative, so that the resulting index number cannot be considered a precise measure of the change in the average level of prices. That the magnitude of error is by no means small is shown by the revision of the original index number of wholesale prices of the United States Bureau of Labor Statistics. This index number of prices is probably more carefully planned and constructed than any other in use in this country. The original estimate of the rise in prices from 1913 to May, 1920 was 172 per cent. The revised index of the Bureau of Labor Statistics estimates an increase of only 147 per cent from 1913 to May, 1920. The error of 25 per cent of the base is more than one-sixth of the entire change indicated, and constitutes an error of 10 per cent in the estimated average level of prices over a period of seven years. The principal source

of error in index numbers as now constructed is faulty data, altho some accuracy can be gained from further refinement of formulas.

In 1896, the distinguished Dutch economist and statesman, N. G. Pierson, said that index numbers are worthless and misleading because of the large errors they contain, and that since there was little likelihood of great improvement, their use ought to be abandoned.¹⁰ There can be no doubt that the relatively large errors in index numbers impair their usefulness, but they cannot be considered as entirely depriving index numbers of significance. In the hands of untrained persons, uninformed as to the limitations of such measurements, and careless in the use of such data, an index number of prices may even be harmful. Notwithstanding this danger, the usefulness of index numbers for measuring approximately the more important economic phenomena is too great and too important for them to be abandoned. "Altho economists today do not fully agree as to the precise accuracy obtainable by index numbers, there is general agreement that sufficient accuracy is obtainable to make them indispensable in quantitative studies."¹¹ Even the slightly inaccurate but considered estimate that an index number provides is superior to the judgment of a change in the price level that can be made by careful observations without index numbers.

The small inaccuracies of index numbers are not a sufficient reason for giving up their use. But they are significant evidence that such measurements are not conclusive by themselves, and that they must be interpreted with care in the light of available data and the judgment of experienced ob-

¹⁰ N. G. Pierson, "Further Considerations on Index Numbers," *Economic Journal*, March, 1896.

¹¹ W. M. Persons, *Forecasting Business Cycles*, p. 257.

servers. With our limited knowledge of index numbers, it would not be wise to attach significance to minor movements in the index number of prices—say, movements of less than 5 per cent over a period of five years. But it would be equally wrong to assume that a movement of 30 per cent in the same period is not a certain indication of the direction and of the general magnitude of the change in the average level of prices. (The most important caution that can be given is that index numbers must be interpreted carefully and with not too much assurance, for as the term implies an index number of prices *indicates* and does not *measure* changes in the average level of prices.)

While the present status of index numbers is not such as to justify complete faith in their accuracy in fine measurement, there is reason to believe that with improvement in the means of securing data, index numbers constructed with great care will become as accurate as ordinary thermometers. As index numbers come into greater use, as commodities become better classified and price quotations more reliable, a gradual elimination of error from faulty data may be expected. Probably the formulas now in use are sufficiently refined for the purpose of resolving the available data. But further refinement is still possible, and it will be particularly desirable to devise some means of allowing for the varying elasticity of demand for different commodities. The last word of caution on index numbers is that they are useful, but not perfect; and when interpreted with care they offer the next best thing to a precise measurement of the complex phenomena that price movements represent and that index numbers of prices indicate.)

A Note on the Construction of Index Numbers.

The construction of index numbers by various formulas is here illustrated by finding the index number of wholesale prices for 1918 on the base 1913, using the thirteen most important commodities. It must be noted that the number of commodities in the collection is too small to provide an accurate indication of the change in the wholesale price level between these years.

Commodities in the Collection	Prices 1913*	Quantities 1913**	Prices 1918*	Quantities 1918**
1. Beef (lb.) . . . . .	.1295	6,589.0	.2213	10,244.0
2. Cattle (cwt.) . . . . .	.12.0396	69.8	18.8646	118.3
3. Coal, bit. (ton).	1.2700	477.0	2.4000	583.0
4. Cotton (lb.) . . . . .	.1279	2,785.0	.3178	3,298.0
5. Eggs (doz.) . . . . .	.2468	1,722.0	.4827	1,908.0
6. Hay (ton)	11.2500	79.2	21.8958	89.8
7. Hogs (cwt.)	8.3654	68.4	17.5995	82.4
8. Iron, pig (ton).	14.9025	31.0	36.5340	38.1
9. Lumb'r (Mbd.ft.)	90.3974	21.8	121.0455	19.2
10. Petroleum (gal.) . . . . .	.1233	10,400.0	.1695	15,680.0
11. Pork (lb.) . . . . .	.1486	9,211.0	.2495	11,426.0
12. Wheat (bu.) . . . . .	.9131	555.0	2.2352	562.0
13. Oats (bu.) . . . . .	.3758	1,122.0	.7747	1,538.0

* Dollars per unit.

** Millions of units.

(1. The arithmetic mean index number of prices is the average of the price relatives of the given year (1918)—a price relative being defined as the percentage ratio of the price of a good in a given year (1918) to its price in the base year (1913).) This index number is found as follows:

Index Numbers of Prices

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Commodities in the Collection	Prices 1913 (p_0)	Prices 1918 (p_1)	Price Relatives $100(p_1/p_0)$
1. Beef, per lb.	\$.1295	\$.2213	170.9
2. Cattle, per cwt.	12.0396	18.8646	156.7
3. Coal, bit., per ton.....	1.2700	2.4000	189.0
4. Cotton, per lb. ....	.1279	.3178	248.5
5. Eggs, per dozen.....	.2468	.4827	195.6
6. Hay, per ton.....	11.2500	21.8958	194.6
7. Hogs, per cwt.....	8.3654	17.5995	210.4
8. Iron, pig, per ton.....	14.9025	36.5340	245.2
9. Lumber, per M bd. ft.....	90.3974	121.0455	133.9
10. Petroleum, per gallon....	.1233	.1695	137.4
11. Pork, per lb.....	.1486	.2495	167.9
12. Wheat, per bu.....	.9131	2.2352	244.8
13. Oats, per bu.....	.3758	.7747	206.1
Total Price Relatives.....			2501.0
Arithmetic Mean Index Number.....			192.4

2. (The weighted arithmetic mean index number is the weighted average of the price relatives of the commodities in the collection.) The weights may be chosen arbitrarily, that is, on the basis of an estimate of the relative importance of the commodities in the collection; or the weights may be chosen on the basis of the relative total market value of the commodities in the base year (1913) or the given year (1918). In the illustration below the weights are based on the total market value of each commodity, each weight unit representing \$100 million of market value to the nearest unit. Thus, the total market value of beef in 1913 (6,589 million pounds at 12.95¢ a pound) was \$853 million, and the weight assigned to beef in 1913 is 9. Similarly, the total market value of beef in 1918 (10,244 million pounds at 22.13¢ a pound).

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was \$2,267 million, and the weight assigned to beef in 1918 is 23.

Commodities in the Collection	Price Relatives	Wgts 1913	1913 Wgt'd Relatives	Wgts 1918	1918 Wgt'd Relatives
1. Beef	170.9	9	1,538.1	23	3,930.7
2. Cattle	156.7	8	1,253.6	22	3,447.4
3. Coal	189.0	6	1,134.0	14	2,646.0
4. Cotton	248.5	4	994.0	10	2,485.0
5. Eggs	195.6	4	782.4	9	1,760.4
6. Hay	194.6	9	1,751.4	20	3,892.0
7. Hogs	210.4	6	1,262.4	15	3,156.0
8. Iron	245.2	5	1,226.0	14	3,432.8
9. Lumber.....	133.9	20	2,678.0	23	3,079.7
10. Petroleum	137.4	13	1,786.2	27	3,709.8
11. Pork	167.9	14	2,350.6	29	4,869.1
12. Wheat	244.8	5	1,224.0	13	3,182.4
13. Oats	206.1	4	824.4	12	2,473.2
Total.....		107	18,805.1	231	42,064.5
Weighted Arithmetic Mean					
Index Number		175.8		182.1	
		(1913 Weights)		(1918 Weights)	

It is possible to use the average of the weights of 1913 and 1918. This can be done by adding the total of the 1913 weighted relatives and the total of the 1918 weighted relatives, and dividing this sum by the total of the 1913 and 1918 weights. The weighted arithmetic mean index number weighted in this manner is 180.1.

3. (The geometric mean index number is the geometric average of the price relatives of the given year (1918) that is, the n th root of the product of the n price relatives.) By the use of logarithms the geometric mean can be found with-

out difficulty, for it is the anti-logarithm of the average of the logarithms of the price relatives of the given year (1918).

Commodities in the Collection	Price Relatives	Logarithms of Price Relatives
1. Beef	170.9	2.23274
2. Cattle	156.7	2.19507
3. Coal	189.0	2.27646
4. Cotton	248.5	2.39533
5. Eggs	195.6	2.29137
6. Hay	194.6	2.28914
7. Hogs	210.4	2.32305
8. Iron	245.2	2.38952
9. Lumber	133.9	2.12678
10. Petroleum	137.4	2.13799
11. Pork	167.9	2.22505
12. Wheat	244.8	2.38881
13. Oats	206.1	2.31408
Total.....		29.58539
Average.....		2.27579
Geometric Mean Index Number.....		188.7
(Anti-logarithm of 2.27579)		

The weighted geometric mean index number can be found by weighting the logarithms of the price relatives in a manner similar to that illustrated in finding the weighted arithmetic mean. If the weights of 1913 are used, the weighted geometric mean index number is 172.1. If the weights of 1918 are used, the weighted geometric mean index number is 178.6. It should be noted that the geometric mean index numbers are lower than the corresponding types of arithmetic mean index numbers.

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4. (The index number of prices by the median method is the middle term of the price relatives arrayed in the order of their magnitude.) In this illustration, with thirteen price relatives, the median is the seventh price relative in magnitude.

Order of Magnitude	Price Relative
1. (Lumber)	133.9
2. (Petroleum)	137.4
3. (Cattle)	156.7
4. (Pork)	167.9
5. (Beef)	170.9
6. (Coal)	189.0
7. (Hay)	194.6 Median
8. (Eggs)	195.6
9. (Oats)	206.1
10. (Hogs)	210.4
11. (Wheat)	244.8
12. (Iron)	245.2
13. (Cotton)	248.5

The index number of prices by the median method is 194.6.

The median can be combined with weights to give a weighted index number of prices. Thus, using the 1913 weights illustrated in the weighted arithmetic mean (total of weights, 107), the weighted median would be the price relative 54th in order of magnitude, each weight unit being regarded as a place in the array. The weighted median, using the 1913 weights, is 167.9, the price relative of pork, which occupies places 42 to 55 in the array. If 1918 weights are used (total of weights, 231), the weighted median would be the price relative 116th in order of magnitude. In this illus-

tration the index number is 170.9, the price relative of beef, which occupies places 102 to 124 in the array. The downward bias of the weighted medians should be noted. Over a period of time longer than five years, this bias would disappear.

5. The aggregative index number of prices is the percentage ratio that the total cost of purchasing a collection of goods in the given year (1918) bears to the total cost of purchasing the same collection in the base year (1913). The quantities of goods in the collection may be those of the base year, the given year, or the average of the base and given years.

Commodities in the Collection	Prices* 1913(p_0)	Prices* 1918(p_1)	Quantities** of Goods(q)	Cost in*** 1913(p_0q)	Cost in*** 1918(p_1q)
1. Beef (lb.) . . . . .	.1295	.2213	6,589.0	853.3	1,458.1
2. Cattle (cwt.)	12.0396	18.8646	69.8	840.4	1,316.7
3. Coal (ton)	1.2700	2.4000	477.0	605.8	1,144.8
4. Cotton (lb.) . . . . .	.1279	.3178	2,785.0	356.2	885.1
5. Eggs (doz.) . . . . .	.2468	.4827	1,722.0	425.0	831.2
6. Hay (ton)	11.2500	21.8958	79.2	891.0	1,734.1
7. Hogs (cwt.)	8.3654	17.5995	68.4	572.2	1,203.8
8. Iron (ton)	14.9025	36.5340	31.0	462.0	1,132.6
9. Lumber (M bd. ft.)	90.3974	121.0455	21.8	1,970.7	2,638.8
10. Petroleum (gal.) . . . . .	.1233	.1695	10,400.0	1,282.3	1,762.8
11. Pork (lb.) . . . . .	.1486	.2495	9,211.0	1,368.8	2,298.1
12. Wheat (bu.) . . . . .	.9131	2.2352	555.0	506.8	1,240.5
13. Oats (bu.) . . . . .	.3758	.7747	1,122.0	421.6	869.2
Total cost (millions of dollars).				10,556.1	18,515.8

The aggregative index number on this basis is $\frac{p_1q}{p_0q} 100$, that is,

$$\frac{100 \times \$18,515.8 \text{ million}}{\$10,556.1 \text{ million}} = 175.4$$

* Dollars per unit.

** Millions of units.

*** Millions of dollars.

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This index number was calculated using the quantities of 1913 (q_0). If the quantities of 1918 (q_1) are used, the index number by the aggregative method would be 175.1. If the average of the quantities of the base and given years is used $\frac{(q_0 q_1)}{2}$, the index number would be 175.2. If the index number is calculated by taking the geometric mean of two aggregative index numbers using the quantities of 1913 and the quantities of 1918 $\left(100 \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}} \right)$ the index number would be 175.2, almost precisely the same as if the average quantities of 1913 and 1918 were used in constructing an aggregative index number by the usual method.

Chapter VII

Price Movements

1. *The Variability of Prices*

THE general level of prices in a country is the resultant of many diverse forces. The normal trend of the price level in countries on the gold standard is determined by the supply of gold and the efficiency of its use, and by the volume of production and trade. In general, production has increased at a fairly constant rate—altho there have been periods of rapid increase in production due to technical improvements, and there have been periods of decrease in production due to war—so that changes in the normal trend of prices are likely to be attributable to changes in the production of gold and the efficiency of its use. The normal trend of prices as determined by the supply of gold and of goods is disturbed at intervals by wars and other irregularly occurring phenomena, and by recurring periods of abnormally great or little activity in business. It must be noted that a movement in the price level of any gold standard country tends to bring about a corresponding movement in the price levels of other gold standard countries.

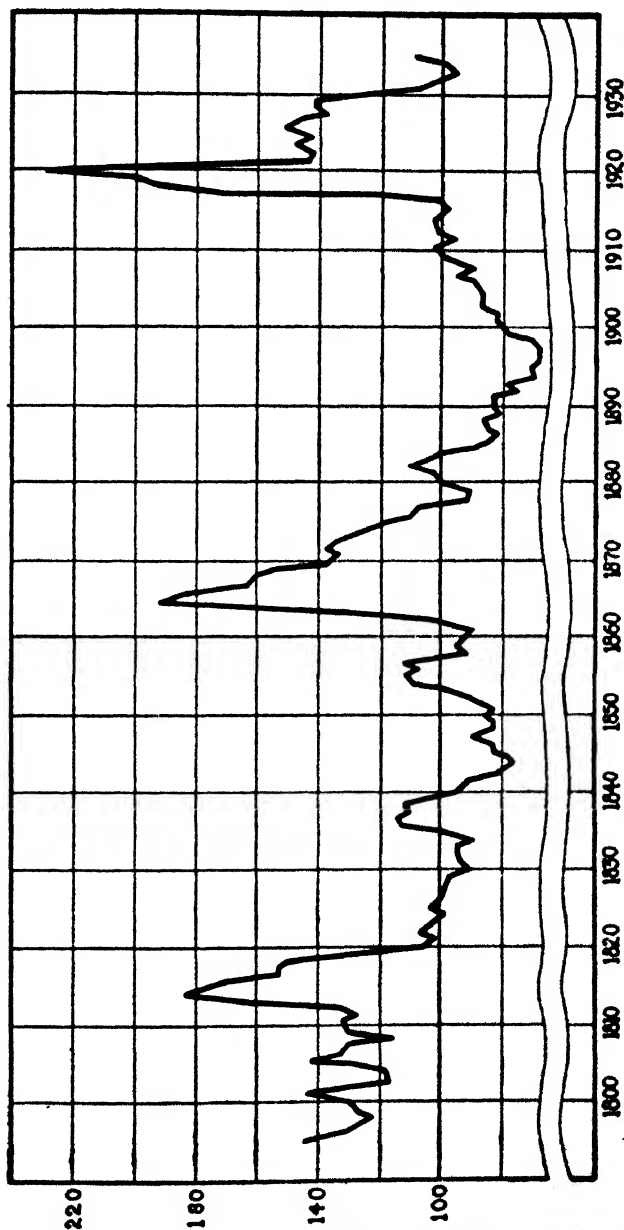
The general level of prices is the average of the prices of many commodities; and variations in the general level of prices are the result of variations in the prices of individual commodities. The most striking characteristic of prices is the tendency toward variability. This is not surprising, for prices are determined by many forces affecting the supply of and demand for goods and money. Nearly all commodities

Prices and Their Measurement

Wholesale Prices in the United States, 1796-1934 *

Year	Index	Year	Index	Year	Index	Year	Index	Year	Index	Year	Index	Year	Index
1796	.....146	1816	.....151	1836	.....114	1856	.....105	1876	.....110	1896	.....68	1916	.....125
1797	.....131	1817	.....151	1837	.....115	1857	.....111	1877	.....106	1897	.....68	1917	.....172
1798	.....122	1818	.....147	1838	.....110	1858	.....93	1878	.....91	1898	.....71	1918	.....191
1799	.....126	1819	.....125	1839	.....112	1859	.....95	1879	.....90	1899	.....77	1919	.....202
1800	.....129	1820	.....106	1840	.....95	1860	.....93	1880	.....100	1900	.....82	1920	.....226
1801	.....142	1821	.....102	1841	.....92	1861	.....89	1881	.....103	1901	.....81	1921	.....143
1802	.....117	1822	.....106	1842	.....82	1862	.....104	1882	.....108	1902	.....86	1922	.....141
1803	.....118	1823	.....103	1843	.....75	1863	.....133	1883	.....101	1903	.....87	1923	.....147
1804	.....126	1824	.....98	1844	.....77	1864	.....193	1884	.....93	1904	.....87	1924	.....143
1805	.....141	1825	.....103	1845	.....83	1865	.....185	1885	.....85	1905	.....88	1925	.....151
1806	.....134	1826	.....99	1846	.....83	1866	.....174	1886	.....82	1906	.....90	1926	.....146
1807	.....130	1827	.....98	1847	.....90	1867	.....162	1887	.....85	1907	.....95	1927	.....139
1808	.....115	1828	.....97	1848	.....82	1868	.....158	1888	.....86	1908	.....92	1928	.....141
1809	.....130	1829	.....96	1849	.....82	1869	.....151	1889	.....81	1909	.....99	1929	.....139
1810	.....131	1830	.....91	1850	.....84	1870	.....135	1890	.....82	1910	.....103	1930	.....126
1811	.....126	1831	.....94	1851	.....83	1871	.....130	1891	.....82	1911	.....95	1931	.....107
1812	.....131	1832	.....95	1852	.....88	1872	.....136	1892	.....76	1912	.....101	1932	.....95
1813	.....162	1833	.....95	1853	.....97	1873	.....133	1893	.....78	1913	.....102	1933	.....97
1814	.....182	1834	.....90	1854	.....108	1874	.....126	1894	.....70	1914	.....99	1934	.....109
1815	.....170	1835	.....100	1855	.....110	1875	.....118	1895	.....71	1915	.....101		

* 1910-1914 = 100. G. F. Warren and F. A. Pearson, *Wholesale Prices in the United States*, Memoir 142, Cornell University, Agricultural Experiment Station.



Wholesale Prices in the United States
1796-1934

vary in price; but there are great differences in the frequency and magnitude of price changes. In general, commodity prices determined by custom, regulated by government, or fixed by combination, vary less frequently than commodity prices determined by competition of producers and of consumers. Altho goods sold under non-competitive conditions vary in price at infrequent intervals, each change is likely to be large.

The relative frequency and magnitude of variations in the price of competitive goods depend upon many characteristics of supply and demand. The more inelastic the demand for a good, the greater is the probable variation in price. Partly for this reason the price of wheat is likely to vary more than the price of sugar. The more irregular the supply of a good, the greater is the probable variation in its price. The stability of the price of meat compared with the price of fish is accounted for largely by the regularity of its supply. Goods produced with a large proportion of fixed capital are more variable in price than goods produced with relatively little fixed capital; and if the fixed capital is very durable, or has a long period of production, the tendency toward variability in price is increased. Partly for this reason the price of cotton cloth varies more than the price of linen. Finally, goods sold to producers are more variable in price than goods sold to consumers. This is evident in the greater stability of retail than of wholesale prices for nearly all goods.

(There are so many factors affecting the prices of individual goods and the general level of prices, that it would be quite difficult to consider in detail even the important factors. The late Governor Strong of the Federal Reserve Bank of New York regarded the following as the more important causes of price changes: ¹

¹ Benjamin Strong, *Interpretations of Federal Reserve Policy*, p. 227.

1. War and political disturbances;
2. Inflated issues of all forms of money and credit instruments;
3. Increased or diminished crops by reason of weather and of social and political conditions and the efficiency of transportation systems;
4. Crop destroying parasites and insects;
5. Epidemics and pestilence;
6. Conflagrations, earthquakes, and like unavoidable calamities;
7. New gold and silver discoveries or mine exhaustion, and consequent enlarged or reduced production;
8. The state of mind of the public—whether in the mood to buy or sell, to go long of goods or short of goods; to stock up or to sell out; to spend or to save; to strike or to work;
9. Government fiscal policy.)

While many variations in the price of individual commodities, and in the general level of prices, are the result of these fortuitous, non-recurring circumstances, there are also regular, almost rhythmic, fluctuations in the price of many commodities, and of the general level of prices. These recurring movements in price are important, because they are the cause, the effect, and the indication of important real changes in the economic life of the community. (Three types of recurring price movements will be considered: the fluctuations in the price of individual commodities and of the general level of prices in the course of a year; the rise and fall of the price level and of the price of some commodities during the indefinite period of time included in a business cycle; and the long time movement in the price level coincident with the secular changes in the production of goods and the supply of money.)

2. Seasonal Variation in Prices.

The price of many commodities tends to show regularity in its movement in the course of a year. That is, a long period observation of the relative prices in different months shows a definite tendency for prices to be lower and higher at certain periods of the year. In general, such seasonal differences in price are due to the non-synchronization of the rate of consumption and the rate of production of some goods. For crops, such irregularity in production as compared with consumption is unavoidable. The limiting factor in the regularity of agricultural production, climate, is not under the control of man. Similarly, it would be difficult and expensive to vary the production of such irregularly consumed commodities as coal to synchronize with the rate of consumption. This would require a large increase in the equipment used in producing coal, much of it lying idle a great part of the year, and it would increase the cost of supplying coal far beyond what it normally is. Therefore, for such commodities as coal and crops, the community finds it more economical to produce and consume at varying rates, utilizing storage facilities to equalize consumption and production in the course of a year.

The seasonal variation in the price of a commodity produced irregularly and consumed regularly can be seen in the monthly prices of cotton. The price of cotton on the New York exchange for each month from August, 1900 to July, 1914 was examined to determine during which month the price of cotton tended to be highest. During five of the fourteen crop years, the price of cotton was highest in July; and the average monthly price of cotton for this fourteen-year period showed definitely the tendency for prices to be highest in July. The persistence of the high price in one

month cannot be considered accidental. It is related to the supply of and demand for cotton that is normal to this month of the year. The demand for cotton may be considered fairly constant throughout the year, but the supply of cotton is exceptionally seasonal. The picking season begins in August, altho most of the crop is picked in September and October. The annual supply of cotton is thus available in a very short period. Cotton immediately after picking may be thought of as produced with all the expenses normal to the planting, growing and picking of cotton. But cotton in June or July is produced with these normal expenses, and the additional expenses of interest, storage, insurance and management for all the months since August or September. To withhold cotton from the market immediately after picking to provide for the demand at the end of the crop year is to incur these additional expenses. It is therefore normal that the price of cotton should be highest in the months immediately preceding the marketing of the new crop.

The price of anthracite coal, a seasonally consumed commodity, tends to show similar variations, with the high price during the season when the rate of consumption most exceeds the rate of production. During the Spring and Summer months, large stocks of anthracite coal are produced and stored. The holding of these stocks involves expense, and this expense is incurred only up to that point where the rise in the price of coal that normally occurs in the late Fall and Winter equals the cost of storage. It would be expected that the price of anthracite coal would be lowest immediately after, and highest immediately before the cold season. An examination of the monthly prices of anthracite coal at New York from April, 1890 to March, 1901 shows that the average price of anthracite coal is lowest in April and May, rises to its highest point in November or December, and then

Average Monthly Prices of Cotton at New York,
August, 1900 to July, 1914

(Cents a pound)

Year	Jan	Feb	Mch	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1900.....	...	...	...	...	...	...	...	9.9	10.6	10.2	9.9	10.1
1901.....	10.3	9.5	8.6	8.4	8.1	8.5	8.4	8.2	8.4	8.4	7.9	8.4
1902.....	8.3	8.6	9.0	9.4	9.6	9.3	9.3	8.9	8.9	8.7	8.5	8.6
1903.....	9.0	9.7	10.1	10.4	11.5	12.4	12.7	12.7	12.0	9.9	11.2	12.8
1904.....	14.4	14.9	15.6	14.4	13.6	11.7	10.9	10.8	11.0	10.3	10.0	7.9
1905.....	7.2	7.7	8.0	7.9	8.3	9.0	11.0	9.1	10.8	10.4	11.4	12.1
1906.....	11.9	11.1	11.3	11.7	11.9	11.1	10.9	11.2	9.7	10.9	10.8	10.7
1907.....	10.9	11.0	11.2	11.1	12.0	13.0	13.1	11.5	12.6	11.5	11.0	11.9
1908.....	11.7	11.5	11.0	10.2	10.9	11.6	11.0	10.3	9.4	9.2	9.4	9.2
1909.....	9.7	9.8	9.8	10.5	11.3	11.5	12.6	12.7	13.0	14.0	14.8	15.2
1910.....	14.9	14.8	15.0	15.1	15.4	15.1	15.7	16.3	14.0	14.5	14.8	15.1
1911.....	9.6	14.3	14.5	14.9	15.8	15.5	14.0	12.5	11.3	9.6	9.4	9.4
1912.....	13.1	10.3	10.6	11.6	11.6	11.6	12.6	12.0	11.7	11.1	12.4	13.0
1913.....	12.7	12.8	12.6	12.3	12.0	12.2	12.3	12.1	13.4	14.1	13.7	13.0
1914.....	11.3	12.8	13.3	13.2	13.4	13.5	12.2	...	...	...	...	...
Average..	11.3	11.4	11.5	11.5	11.8	11.9	11.9	11.3	11.2	10.9	11.1	11.3

falls off sharply in March. This is precisely the variation that would be expected in the price of a commodity consumed as irregularly as anthracite coal.

The general level of prices usually changes so rapidly, and it is affected by so many diverse forces, that its small seasonal movement is difficult to see. A study of five periods of relatively stable prices leaves no doubt that the general level of wholesale prices fluctuates in a regular manner throughout the year. The indications are definite that the price level tends to reach a low point in July and August, and a high point in January and February. "Such fluctuations, for the most part, are due . . . to a continuous adjustment to conditions, which, though changing, are normal and expected. As the autumn periods of harvesting and crop moving approach, there is a tendency toward a lower level of prices,

Price Movements

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Average Monthly Prices of Anthracite Coal at New York,
April, 1890 to March, 1901 *

(Dollars a ton)

Year	Jan	Feb	Mch	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1890.....	...	...	...	3.58	3.52	3.54	3.59	3.62	3.76	3.79	3.94	3.99
1891.....	4.11	3.99	3.80	3.67	3.67	3.71	3.71	3.74	3.80	4.00	4.05	4.00
1892.....	3.72	3.56	3.71	3.80	3.88	4.06	4.17	4.42	4.60	4.67	4.63	4.62
1893.....	4.58	4.56	4.07	3.95	3.90	3.91	4.12	4.29	4.23	4.26	4.24	4.20
1894.....	4.16	4.03	3.85	3.57	3.50	3.54	3.55	3.58	3.33	3.28	3.40	3.40
1895.....	3.46	3.48	3.31	3.11	3.09	3.01	2.94	2.89	2.93	3.01	3.08	3.19
1896.....	3.29	3.44	3.56	3.57	3.57	3.73	3.88	4.05	4.06	4.09	4.22	4.08
1897.....	3.99	3.99	4.06	4.06	4.05	4.06	4.06	4.06	4.06	4.06	3.94	3.77
1898.....	3.73	3.87	3.89	3.90	3.95	3.92	3.91	3.83	3.73	3.66	3.62	3.57
1899.....	3.56	3.54	3.52	3.56	3.63	3.65	3.67	3.68	3.80	3.91	3.95	3.98
1900.....	4.05	4.01	3.86	3.72	3.72	3.67	3.67	3.67	3.86	4.35	4.42	4.34
1901.....	4.45	4.60	4.45	...	...	...	...	...	...	...	...	...
Average..	3.91	3.91	3.79	3.68	3.68	3.71	3.75	3.80	3.83	3.91	3.95	3.92

* E. Jones, *The Anthracite Coal Combination in the United States*.

followed after the passing of this period and the approach of winter by a rise in prices.”² The seasonal movement in the wholesale price level reflects two forces: the lower prices of agricultural commodities immediately after harvests, and the restriction of credit in industrial centers as credit is expanded in agricultural regions.

Average Monthly Variations in Wholesale Prices *

Years	Jan	Feb	Mch	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1826-28...100.0	99.3	98.0	96.7	96.7	97.0	97.3	96.3	96.7	97.7	97.7	99.3	
1831-33... 95.7	94.7	94.3	94.0	94.0	92.3	92.0	92.3	94.3	95.0	95.7	95.7	
1848-51... 84.5	84.7	84.5	83.7	83.0	81.5	81.2	81.0	82.0	82.2	81.7	82.0	
1889-91... 82.0	82.0	82.0	82.3	81.7	81.0	80.7	81.7	82.0	82.0	81.0	81.3	
1902-05... 87.5	88.0	86.7	86.7	85.7	86.0	86.0	86.2	86.7	88.0	87.7	88.2	
Average..	89.9	89.7	89.2	88.9	88.2	87.6	87.4	87.5	88.3	89.2	88.8	89.3

* 1910-1914 = 100.

² I. Fisher, *The Purchasing Power of Money*, p. 72.

3. Cyclical Variation in Prices

The recurring movement in the prices of many commodities, and of the price level, that has attracted most attention and study is that associated with business cycles. Beyond question there is a tendency for prices to rise and fall with variations in business activity. But business cycles are not always accompanied by large changes in the price level; and it would be completely wrong to assume that the prices of nearly all commodities rise and fall with cyclical variations in business. Nevertheless, some commodities do have price fluctuations that harmonize with changes in business activity; and so close is this relationship in some instances, that fluctuations in the price of some commodities are regarded as indicators of the course of business activity.

Some commodities show little price variation during business cycles. For instance, the price of cross-cut saws, hand-saws and trowels varied little during the period from 1890 to 1925, altho the country was passing thru ten business cycles. The price of anthracite coal, similarly, showed only a slight tendency to vary in harmony with the movement of the price level during business cycles. This important commodity went thru three price cycles while the country was passing thru ten business cycles. Even so important a commodity as steel rails failed to pass thru more than five price cycles in this same period, altho metal products are, on the whole, very sensitive to variations in business. The conclusion is unmistakable that there is no universal tendency for individual prices to vary during business cycles.

On the other hand, a large number of commodities, particularly the raw materials of production and materials used in making capital goods show a cyclical variation in price with every recent business cycle. Among such goods are pig

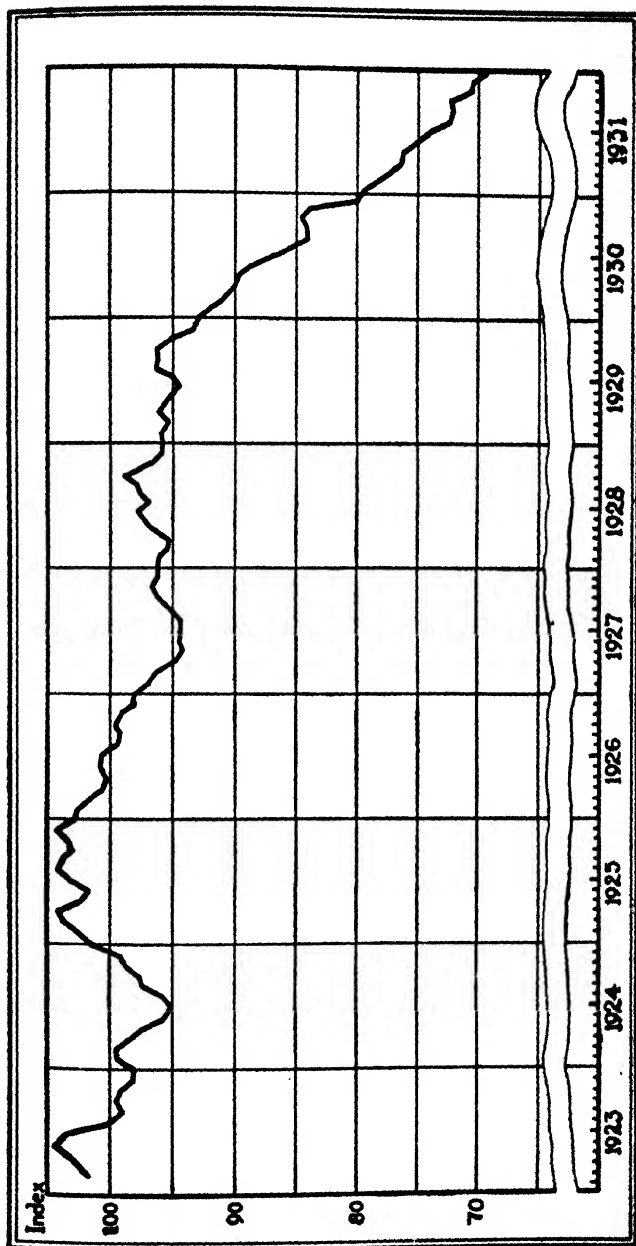
iron, tin, copper, bituminous coal, coke, cattle, hides and cotton. Even consumers' goods, such as coffee, fresh beef and dairy products, show unusual sensitivity to changes in business conditions. The relationship of these goods to changes in business activity is not precisely the same in every instance. Pig iron generally falls in price some months before the decline in business activity, and rises in price some time after the increase in business activity has begun. The commodities whose prices tend to fall before the decline in business activity generally have a longer period of falling than of rising prices; while commodities that tend to rise in price before the increase in business activity generally have a longer period of rising prices. On the whole, prices of different goods tend to move together more harmoniously during falling than during rising price periods. The upward movement in the price level during a business revival is generally the result of the early rise in price of a few commodities, most goods remaining nearly constant in price for some time during revival, then rising individually and in groups.

The variation in general prices during different phases of a business cycle is more marked and more regular than the variation in individual commodity prices. It is generally true that the period of business revival is accompanied by a slow rise in the price level, the period of prosperity by a sharp rise in the price level, the period of recession by a sharp fall in the price level, and the period of depression by a slow fall in the price level, culminating in a period of almost stable prices for some time before revival. The manner in which the price level moved during recent business cycles can be seen in the table below. The decline in the wholesale price level during the recessions of 1924, 1927 and 1930 is particularly noticeable.

Index Number of Wholesale Prices, January, 1923 to December, 1931 *

Years	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1923.....	102.0	103.3	104.5	103.9	101.9	100.3	98.4	97.8	99.7	99.4	98.4	98.1
1924.....	99.6	99.7	98.5	97.3	95.9	94.9	95.6	97.0	97.1	98.2	99.1	101.5
1925.....	102.9	104.0	104.2	101.9	101.6	103.0	104.3	103.9	103.4	103.6	104.5	103.4
1926.....	103.2	102.0	100.6	100.3	100.5	100.4	99.5	99.1	99.7	99.4	98.4	97.9
1927.....	96.5	95.8	94.7	94.1	94.2	94.1	94.3	95.2	96.3	96.6	96.3	96.4
1928.....	96.4	95.8	95.5	96.6	97.5	96.7	97.4	97.6	98.6	96.7	95.8	95.8
1929.....	95.9	95.4	96.1	95.5	94.7	95.2	96.5	96.3	96.1	95.1	93.5	93.3
1930.....	92.5	91.4	90.2	90.0	88.8	86.8	84.4	84.3	84.4	83.0	81.3	79.6
1931.....	78.2	76.8	76.0	74.8	73.2	72.1	72.0	72.1	71.2	70.3	70.2	68.6

* 1926 = 100.



Wholesale Prices in the United States
January, 1923-December, 1931

The rise and fall of commodity prices, and the sequence and magnitude of these variations, convince Professor Mills that there is a causal relationship between business fluctuations and price movements of a cyclical nature. He writes: ³

There are true economic regularities in the price movements which accompany cycles in general. In cycle after cycle there has been observed a degree of uniformity in the sequence of revival and recession in commodity prices and in other aspects of price behavior. If cyclical movements represented the play of mere variability about a mean or trend, one would expect the sequence of price change in each cyclical swing to be unique, except for certain chance resemblances to movements at other times. Yet the odds against chance alone accounting for the regularities we have found are infinitely great. In period after period there is a recurrence of price movements which have something in common, in respect to sequence of change, amplitude and duration. These changes in different periods are far from showing perfect uniformity, but there is unmistakable evidence that the observed resemblances would not be found if the cyclical movements of individual prices represented random fluctuations alone.

There is no need at this point to anticipate the later discussion of the monetary aspect of business cycles. It is important to note that the rise and fall of prices during the various phases of a business cycle are not related to variations in the available supply of monetary gold. Professor Cassel has shown that even when allowance is made for differences in the supply of monetary gold, the phenomenon of cyclical variations in prices persists. There is a rise and fall in the volume of payments made during the different phases of a business cycle; but this variation in the volume of payments

³ F. C. Mills, *The Behavior of Prices*, p. 159.

is provided for by a change in the intensity of utilization of deposit money and lawful money, and by a change in the quantity of deposit money and lawful money as far as the limiting condition of the supply of gold will permit.⁴ Needless to say, cyclical variations in prices are found in countries not on the gold standard as well as in gold standard countries.

4. *Secular Movement of Prices*

A study of annual averages of wholesale prices over many years indicates a continued trend upward or downward for long periods that cannot be accounted for by cyclical variations. A nine-year moving average of prices—the average of prices for a given year and for four years immediately before and after—minimizes cyclical influences, and emphasizes the fundamental trend. The best series for this purpose is that of wholesale prices in England, for they were less affected by tariffs and by other restrictions on trade than the prices of other countries. In the 75 years from 1846 to 1920 there seem to be three well defined price movements of about 25 years during which prices moved upward, then downward, and again upward. It has already been indicated that changes in the normal trend of prices in gold standard countries are probably attributable to coincident changes in the production of gold and in the monetary stock of gold.

The general relationship between the production of gold and the long period price movement is clearly shown by the statistical data. For more than twenty years before the upward movement in prices in the late 1840's, the price level had been falling steadily, largely because of the insufficient production of gold and silver. From 1821 to 1840, the annual production of gold averaged approximately 550,000 fine ounces. After 1840 and until the end of the upward price

⁴ G. Cassel, *A Theory of Social Economy*, pp. 572-579.

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movement in the early 1870's, the production of gold increased tremendously. The table given below indicates the change.

Nine-Year Moving Average of Wholesale Prices in England *

Year	Index	Year	Index	Year	Index	Year	Index	Year	Index
1846..	94	1861..	117	1876..	113	1891..	82	1906..	87
1847..	92	1862..	117	1877..	110	1892..	79	1907..	88
1848..	92	1863..	118	1878..	106	1893..	78	1908..	90
1849..	94	1864..	119	1879..	104	1894..	77	1909..	92
1850..	97	1865..	119	1880..	101	1895..	77	1910..	94
1851..	100	1866..	118	1881..	98	1896..	77	1911..	95**
1852..	102	1867..	118	1882..	95	1897..	78	1912..	98**
1853..	106	1868..	119	1883..	92	1898..	78	1913..	108**
1854..	108	1869..	120	1884..	91	1899..	78	1914..	120**
1855..	110	1870..	120	1885..	89	1900..	79	1915..	132**
1856..	113	1871..	119	1886..	87	1901..	81	1916..	147**
1857..	116	1872..	118	1887..	85	1902..	83	1917..	152**
1858..	117	1873..	118	1888..	84	1903..	85	1918..	156**
1859..	117	1874..	116	1889..	82	1904..	86	1919..	161**
1860..	117	1875..	115	1890..	81	1905..	85	1920..	166**

* 1913 = 100. J. P. Young, *European Currency and Finance*, vol. I, pp. 450-452.

** Prices in terms of gold, 1915-1924.

Production of Gold, 1841 to 1870 *

From 1841 to 1845, an average of 1,267 thousand fine ounces, annually							
"	1846 to 1850,	"	"	"	2,255	"	"
"	1851 to 1855,	"	"	"	6,187	"	"
"	1856 to 1860,	"	"	"	6,361	"	"
"	1861 to 1865,	"	"	"	5,975	"	"
"	1866 to 1870,	"	"	"	6,243	"	"

* G. F. Warren and F. A. Pearson, *Prices*, p. 97.

After 1871 and until 1891, the production of gold fell off, and with it came a steady decline in the price level that continued until 1895. The following table shows the decrease in the production of gold in this period.

Production of Gold, 1871 to 1895 *

From 1871 to 1875, an average of	5,405	thousand	fine	ounces,	annually
" 1876 to 1880, " " "	5,340	"	"	"	"
" 1881 to 1885, " " "	4,940	"	"	"	"
" 1886 to 1890, " " "	5,461	"	"	"	"
" 1891 to 1895, " " "	7,882	"	"	"	"

* G. F. Warren and F. A. Pearson, *Prices*, p. 97.

The slight increase in production from 1891 to 1895 minimized the fall in prices; and with the great increase in the production of gold after 1896, prices rose steadily until 1920. The production of gold from 1896 to 1920 is shown in the following table.

Production of Gold, 1896 to 1920 *

From 1896 to 1900, an average of	12,447	thousand	fine	ounces,	annually
" 1901 to 1905, " " "	15,607	"	"	"	"
" 1906 to 1910, " " "	20,971	"	"	"	"
" 1911 to 1915, " " "	22,259	"	"	"	"
" 1916 to 1920, " " "	18,964	"	"	"	"

* G. F. Warren and F. A. Pearson, *Prices*, p. 97.

The output of the ten years from 1907 to 1916 was the highest sustained production of gold in history. It must be noted that prices seem to lag about five years behind gold production.

Professor Cassel has utilized the concept of a normal rate of production of gold to explain the movement of prices during long periods. He finds that the index numbers of whole-

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sale prices, Sauerbeck's index, for 1850 and 1910 were approximately equal; and that the four-year averages for 1848-1851 and 1908-1911 were precisely equal. The supply of monetary gold in 1850 and the supply of monetary gold in 1910 were therefore enough to maintain an equal price level in these years. He concludes that if the supply of monetary gold had increased at a regular rate in this period, approximately 3 per cent annually, any variation in the price level would have been due to the irregular rate at which economic development took place. In this sense, Cassel attributes the price movements in the years between 1850 and 1910 to two fundamental causes—first, economic, the deviation of the development of economic activity from its normal rate; second, monetary, the deviation of the actual supply of monetary gold from the calculated normal supply of monetary gold. In fact, he finds that for the period under consideration, 1850 to 1910, "the main cause of the secular variations of the general price level lies in the changes in the relative gold supply."⁵ The conclusion is that if normal prices are to remain stable in gold standard countries, it is necessary that the world's supply of monetary gold should be increased at the constant rate of approximately 3 per cent.

This concept of a necessary increase in the volume of monetary gold to maintain stable prices during a period of increased production is obviously not new. The simple text books of the early nineteenth century state that changes in the price level are attributable to changes in the rate of production of the money metals and of goods. Mrs. Marcet in her *Conversations on Political Economy* wrote:⁶

⁵ G. Cassel, *A Theory of Social Economy*, p. 447. For his theory of relative gold supply, see pp. 441-454.

⁶ J. H. Marcet, *Conversations on Political Economy* (1817), p. 271.

If the quantity of the precious metals annually extracted from the mines be exactly what is required for the arts, and for the additional specie necessary to circulate the increasing produce of the land, there will be no change in the value of money, and commodities will continue to be bought and sold at their former prices. If less gold and silver be extracted than is requisite for these purposes, goods will fall in price; and if, on the contrary, a greater quantity be produced, goods will rise in price, the fluctuations in the price of commodities gradually and constantly conforming to the variations of the scale by which their value is measured.

There is, of course, nothing fundamentally wrong in Cassel's method of approach. It recognizes that variations in prices from a normal level are the joint effect of two causes—a deviation of the rate of economic development and of the rate of increase of the supply of monetary gold from a long period average regarded as normal. It must be noted, however, that this theory assumes that the price level was the same at the beginning as at the end of the period, and that this price level was normal. There is no sound reason for believing that Sauerbeck's index number is a satisfactory method of measuring the price level. The base, the formula and the collection of commodities in the Sauerbeck index seem inadequate for this purpose. The theory also assumes that the rate of economic development in the period from 1850 to 1910 was normal, for which assumption there is no satisfactory evidence. Again, no allowance is made in this analysis for the lag between the production of gold and its influence on prices. Finally, the theory assumes that the efficiency in the use of gold increases at a constant rate. This is probably the greatest weakness in Cassel's analysis.

The use of gold as a monetary standard was nearly world wide in 1910; whereas in 1850 gold was probably less important than silver in the monetary systems of the world. Thus, in the period from 1850 to 1910, the average annual increase of approximately 3 per cent in the supply of monetary gold was sufficient not only to offset the economic development of the period, but also to provide a monetary reserve for countries adopting the gold standard. On the whole, the progressive rate of increase in the efficiency of gold was given inadequate consideration in this theory.⁷ Cassel recognized, however, that his results are valid only for the period he studied. "To apply these results to the future is only possible on the assumption that the demand develops as it has done during the period in question."⁸

The theory of Warren and Pearson that the normal price level at any time is determined by the percentage ratio of the index of the supply of monetary gold to the index of the volume of production is somewhat related to Cassel's theory of relative gold supply.⁹ There is a striking correspondence between movements in the ratio of the supply of monetary gold to the volume of production, and the normal price level. From 1848 to 1872, the annual volume of production for the world increased by nearly 120 per cent. In the same time, the world's stock of monetary gold increased by nearly 180 per cent. It would be expected, therefore, that prices would rise. In fact, the normal price level—the nine-year moving average of wholesale prices in England—rose 30 per cent, while the ratio of the supply of

⁷ Cf. J. T. Phinney, "Gold Production and the Price Level: The Cassel Three Per Cent Estimate," *Quarterly Journal of Economics*, August, 1933, pp. 647-679.

⁸ G. Cassel, *A Theory of Social Economy*, p. 454.

⁹ G. F. Warren and F. A. Pearson, *Prices*, chap. V.

monetary gold to the volume of production rose 27 per cent. From 1872 to 1896, the volume of production increased by 110 per cent, and the supply of monetary gold increased by 44 per cent. In this period, the normal price level fell 35 per cent, and the ratio of monetary gold to production fell 32 per cent. The period from 1896 to 1920 was disturbed by the World War, and the correlation of prices and the ratio of gold to production is less striking. In these years, the volume of production increased by 66 per cent, and the supply of monetary gold increased by 130 per cent. The nine-year moving average of wholesale prices in England—prices in terms of gold from 1915 to 1924—rose more than 90 per cent, while the ratio of monetary gold to the volume of production rose less than 40 per cent. This great difference is attributable to the dissociation of the monetary systems of nearly all countries from gold during the war and early post-war periods.

The conclusion of Warren and Pearson rests entirely upon a statistical analysis. They say: "For 75 years before the World War, world monetary stocks of gold had to increase at the same rate as the world physical volume of production in order to maintain stable commodity prices in England. If gold stocks increased more rapidly than other things, prices rose; if they increased less rapidly, prices fell."¹⁰ Altho this is a fair statement of the facts, it throws little light on the probable relationship of gold to prices in the future, for the supply of monetary gold and the volume of production are not the only factors affecting normal prices. In these 75 years the increase in the supply of monetary gold was accompanied by a great increase in the efficiency of the use of gold in the monetary systems of the world. At the

¹⁰ G. F. Warren and F. A. Pearson, *Prices*, p. 81.

same time, the increase in the volume of production was accompanied by the adoption of the gold standard in many countries. The effect of the more extensive use of gold in the monetary systems of the world was almost precisely offset by the more efficient use of gold. The correspondence of normal prices and the ratio of gold to production in the years before the war, therefore, was in part accidental, and a similar correspondence cannot be expected in the future. The dependence of the monetary systems of the world on gold is not likely to become greater. If the increase in the efficiency in the use of gold should continue, and it probably will, the normal level of prices in the future is likely to be higher than the ratio of the supply of monetary gold to the volume of production.

Altho the theories of Cassel and of Warren and Pearson cannot be regarded as an adequate explanation of long period movements in the price level, there is sufficient evidence to show that changes in the normal price level are related to changes in the production of gold. This relationship is modified by so many other factors—changes in monetary standards and in monetary needs—that it is impossible to state the relationship in precise statistical terms. All that can be said for certain is that if the production of gold is considerably increased for an extended period, the price level in gold standard countries is likely to begin to rise after a time; and if the production of gold is decreased or only slightly increased for an extended period, the price level in gold standard countries is likely to begin to fall after a time. In the meantime, long period movements in prices may be interrupted, altho not changed, by the cyclical influences which predominate in short periods.

The continued movement of the normal price level in one

direction for approximately 25 years in three recent periods might seem to indicate that there is a long-time cycle of this length affecting the production of gold and normal prices. If the production of gold had in this time always been from known sources of supply, it would have been possible to argue that there is a long-period cycle in the production of gold and in normal prices. In fact, the increased production of gold after the 1840's and the 1890's was due to the discovery of new sources of supply in California, Australia and South Africa. To a large extent these increases in the production of gold were fortuitous, altho not entirely unrelated to the falling price level before these years. The sources of gold supply have now been well explored, and the possibility of another increase in the production of gold comparable to the increase in the production of these earlier periods is remote. The conclusion is that while there may be a long-time cycle in normal prices due to variations in the rate of production of gold, it is extremely difficult to show this for the limited period for which adequate statistical data are available.

5. Price Movements During War

One of the factors most disturbing to the orderly movement of price is war. There seems to be a marked tendency for wars to occur during periods of rising prices. The years from 1820 to 1850, a period of falling prices, were relatively free from war, at least major wars. Between 1850 and 1873, a period of rising prices, the following important wars were fought: the Crimean War, involving Russia, England, France and Sardinia; the war for the Southern Confederacy; the various wars of Italian liberation; and the series of wars in which Prussia was involved with Denmark, Austria and France. Again, from 1873 to 1896, a period of falling prices,

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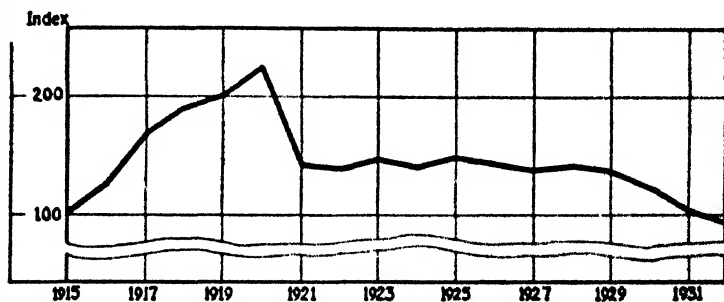
there were few major wars. Between 1896 and 1920, a period of rapidly rising prices, the following important wars were fought: the American war with Spain; the Boer war; the Russian war with Japan; the Italian war with Turkey; the various Balkan wars; and the World war. The causal relationship between war and prices is extremely difficult to determine. There can be no doubt that wars tend to bring about high prices; but it is also probable that periods of rising prices are favorable for carrying on war. The incidents that

War and Post-war Prices in the United States *

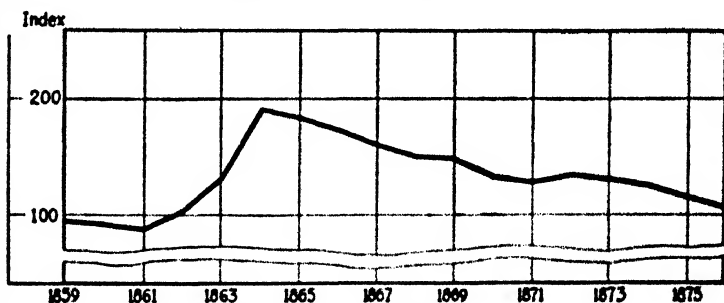
War of 1812		Civil War		World War	
Year	Index	Year	Index	Year	Index
1810.....	131	1859.....	95	1915.....	101
1811.....	126	1860.....	93	1916.....	125
1812.....	131	1861.....	89	1917.....	172
1813.....	162	1862.....	104	1918.....	191
1814.....	182	1863.....	133	1919.....	202
1815.....	170	1864.....	193	1920.....	226
1816.....	151	1865.....	185	1921.....	143
1817.....	151	1866.....	174	1922.....	141
1818.....	147	1867.....	162	1923.....	147
1819.....	125	1868.....	158	1924.....	143
1820.....	106	1869.....	151	1925.....	151
1821.....	102	1870.....	135	1926.....	146
1822.....	106	1871.....	130	1927.....	139
1823.....	103	1872.....	136	1928.....	141
1824.....	98	1873.....	133	1929.....	139
1825.....	103	1874.....	126	1930.....	126
1826.....	99	1875.....	118	1931.....	107
1827.....	98	1876.....	110	1932.....	95

* 1913 = 100.

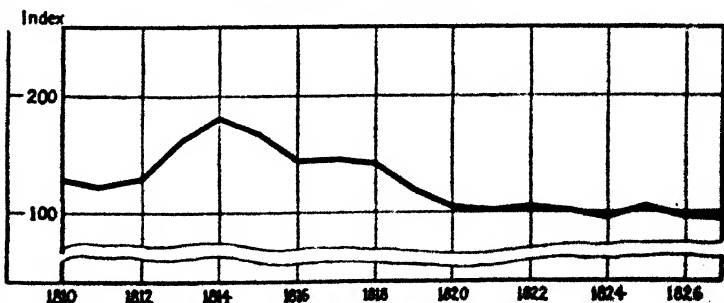
WAR AND POST-WAR PRICES IN THE UNITED STATES



WORLD WAR



CIVIL WAR



WAR OF 1812

strain diplomatic relations during periods of falling prices become causes of war during periods of rising prices.

The movement of prices during important wars seems to follow a definite pattern. In the three major wars of this country—the War of 1812, the Civil War and the World War—the tendency was for prices to rise rapidly at the outbreak of war, to fall sharply at the close of the war, and then to fall gradually for an extended period after the war. Prices fell at the close of these wars for two reasons: first, the end of government borrowing and other governmental financial operations diminished the supply of purchasing power that came into the hands of the community; second, these wars came at the close of a period in which prices were rising, so that a fall in prices would have occurred under any circumstances. It is certain that a major war brings about a rise in prices, not only in the belligerent countries, but in all countries in economic contact with the belligerents. By raising the world level of prices to a peak before the time when this maximum would normally have been reached, war undoubtedly hastens the period of falling prices. And by raising prices to a level that would not otherwise have been reached, the fall in prices is increased, and the subsequent difficulties are intensified.

It has generally been argued that the war-time rise in prices is unnecessary and undesirable, because it adds to the debt burden of the community after prices have fallen. J. M. Keynes has argued that the war-time rise in prices is necessary as a device for restricting the consumption of the community, and for concentrating income in the hands of business men from whom it can be transferred more easily to the government by means of loans and taxes. If the war-time rise in prices is necessary, it is nevertheless questionable

whether the post-war fall in prices is desirable. If a gold standard country wishes to retain its pre-war monetary standard in its pre-war form, it is impossible to avoid a fall in prices after the war. But if a country has a managed monetary system, or is willing to change its monetary standard, there is no reason why the post-war fall in prices cannot be avoided. .

PART THREE

The Value of Money

Chapter VIII

Theories of the Value of Money

1. *The Cost of Production of Money and Its Value*

THE value of money is the central problem of monetary theory; and careful consideration of the concrete problems of our monetary system requires an understanding of the forces determining the value of money. So numerous and complex are the forces affecting the value of money, that it is not surprising that there are great differences of opinion on this question. It has already been stated that the purchasing power of money, its value, is the inverse of the average of the prices of the goods and services for which it is given—that is, the inverse of the price level. An explanation of the manner in which the value of money is determined must clarify two points: first, what makes the price level what it is, and not higher or lower; second, what makes the price level rise or fall.

It is sometimes said that the value of money is determined in the same manner as the value of all goods and services in our economic society. The normal value of a commodity, freely reproducible and sold under competitive conditions, is the expense of producing that commodity in the quantities the community demands. Similarly, it is said that the normal value of money is determined by its expense of production. It is difficult to use this approach in considering the forces determining or affecting the value of money in our community. In the first place, money is not always a commodity

produced by labor and capital. In many monetary systems, the supply of money is completely controlled by government and banks; and it is impossible to speak of the expense of producing such money in the same sense in which one speaks of the expense of producing goods. In the second place, whatever tendency there may be for the value of commodity money to be determined by its expense of production is diminished by prevailing interference with the free flow of goods and of the money commodity between countries. And in the third place, to say that the normal value of commodity money is determined by its expense of production is to give no indication of the causal relation between the value of money and its expense of production. Undoubtedly, the normal value of commodity money is equal to its expense of production. But the expense of producing commodity money is determined in part by the money rates of remuneration of the factors of production; and these money rates of remuneration are themselves largely determined by the value of money. It is therefore more nearly correct to say that the expense of producing commodity money is determined by its value than to say that the value of money is determined by its expense of production.

This difficulty can be avoided by disregarding money expenses and by considering the real costs—the labor and waiting—required to produce goods, including commodity money. It is then true that the normal value of commodity money is determined by the relative real cost of producing money, and of producing the goods and services purchased with money. Allowance must be made for the different proportions of labor and capital used in producing money, and in producing the goods and services for which money

is spent; and for differences in the kind of labor used in producing money, and in producing goods and services. With these qualifications, it can be said that the normal value of money is determined by its cost of production; and that changes in the normal value of money are the result of changes in the relative real cost of producing commodity money, and of producing the goods and services purchased with money.

Unfortunately, this throws no light upon the forces determining or affecting the value of money in a country not upon a commodity standard; and it gives little indication of the forces determining or affecting the value of commodity money, not normally, but at any given time, or of causes of changes in the value of money during short periods. At any time, the cost of producing commodity money depends upon and varies with its value. Altho in the long run the normal value of commodity money is determined by its relative real cost of production, this is an inadequate explanation of the prevailing price level, and of the large and frequent changes in the price level from time to time. Admitting the long run relationship between the cost of producing commodity money and its normal value, the question still remains whether this is a direct relationship, or an indirect relationship depending upon the effect of the cost of production on the quantity of commodity money.

2. *The Bullionist Theory of Money*

(The extreme application of the cost of production and of other commodity aspects of money leads inevitably to a bullionist theory of money. Ellis lists the following fundamental doctrines of the bullionist theory of money:

1. Money circulates only because of the utility of the money commodity;
2. Lawful money and deposit money are only substitutes for commodity money;
3. The value of these substitutes for money comes from the value of commodity money;
4. The substitutes for money operate on the value of money indirectly by reducing the demand for the money commodity;
5. The value of irredeemable paper money depends upon the prospects of ultimate redemption in commodity money;
6. Changes in the value of commodity money are largely due to changes in the real cost of producing goods.¹)

The first, the fifth, and the sixth of these fundamental doctrines of the bullionist theory of money are particularly objectionable in explaining the value of money.

The monetary systems of all countries were at one time or another based upon a gold or silver standard, and money was convertible into gold or silver coin. According to the bullionist theory of money, under such conditions the value of a unit of money is determined by the supply of and demand for the money commodity in industrial uses; altho the monetary uses of gold or silver, as coin and as reserves for lawful money and for deposit money, reduce the supply available for non-monetary uses and increase the value of the money commodity. As Senior said: "The value of the precious metals, as money, must depend ultimately on their value as materials of jewellery and plate; since, if they were not used as commodities, they could not circulate as money."² In the long run, the value of the money commodity is determined by its cost of production; and in the

¹ Cf. H. S. Ellis, *German Monetary Theory, 1905-1933*, p. 5.

² N. W. Senior, *The Value of Money*, p. 17.

short run, according to the bullionist theory, its value is relatively fixed, because the available supply is large compared to the annual output, and because the demand for gold or silver changes slowly. Changes in the value of money—in the general level of prices—are regarded as due to changes in the real cost of producing the goods and services purchased with money.

The bullionist theory uses similar reasoning to explain the value of money in countries on a free managed standard. At one time the inconvertible money was redeemable in gold, and presumably at some future time redemption will be resumed on some terms. Under such conditions, the value of inconvertible paper money is determined by the prospective terms of redemption, allowance being made for the risk of permanent inconvertibility, and for discount to the time of probable redemption. If, for instance, a government issues large quantities of paper money, the difficulties of redemption become apparent, there is a demand for conversion into gold, and redemption is suspended. As the prospects of future redemption become clarified, the value of money tends to be fixed at the terms of prospective redemption.³ It is for this reason that the value of money during a war, according to the bullionist theory, varies with the military success of the country. And if it is expected that redemption will be undertaken at a lower rate than formerly, the value of money will reflect this possibility.

³ Here is one view as to what determined the value of the paper pound during the restriction of specie payments, 1797 to 1821. "And if a Bank of England note can no longer be exchanged at pleasure for specie, in what does its value consist? In the expectation that it will one day be paid in gold, or something equivalent to gold: this opinion renders bank-notes still current: were such confidence destroyed, their value would be reduced to that of the paper of which they are made." J. H. Marcet, *Conversations on Political Economy*, p. 281.

The theory is also applied to more complex instances of non-convertible money. In 1873, Holland suspended the free coinage of silver. The guilder was still convertible into silver, but its value rose above that of its silver content. Obviously, the value of the guilder was not determined by the value of the silver for which it could be redeemed. The explanation must be, according to the bullionist theory, that the value of the guilder reflected the prospect of an eventual change from the silver standard to the gold standard at a higher value than the silver content of the guilder. In fact, the guilder was ultimately placed on a gold basis; and it can be argued that this possibility had determined the value of the guilder after the free coinage of silver was suspended. However, it is quite difficult to explain by the bullionist theory the superior value of a unit of Swedish money over its former and later equivalent in gold, when the free coinage of gold was suspended during the World War. Nor is it possible to explain by the bullionist theory why prices do not immediately rise proportionately when the bullion equivalent of a unit of money is reduced. Invariably, when the monetary unit of a country is devalued there is a lag in the price level, a phenomenon that is inexplicable by the bullionist theory of the value of money.

The value of money in the purchase of goods and services for consumption, according to this theory, is determined by the value of bullion. Changes in the value of money can be due to causes working from the side of gold, or causes working from the side of goods. The stock of gold is so large and changes so slowly, it is argued, that the cause of a sudden or extreme fluctuation in the value of money must operate from the side of goods. This cause is clearly the changing cost of producing goods and services. Professor

Laughlin, a leading advocate of this view, wrote: "If the standard were supposed to be constant, any one knows that changes of price could be brought about by changes in the expenses of production of goods. Put a tax on goods and it is expected in general that their prices will rise; introduce wonderful new inventions which save labor, and without question the price of the goods thus affected will fall. In neither case is it possible to refer the change in prices to changes in the demand and supply of money."⁴

The view common among bankers and business men that gold is an unchanging measure of value is based on this theory, that forces affecting the value of money cannot act easily or quickly thru gold. It is not true, of course, that the value of money convertible into gold tends to remain constant in terms of goods. It is merely that changes in the value of money, according to this theory, are due to forces affecting the production of goods. "The purchasing power of gold is constantly changing, but not for causes affecting gold itself; it is changing through constant changes in the expenses of bringing goods to the market."⁵ While the changes in the value of money due to changes in the cost of producing goods generally are gradual, attempts are occasionally made to maintain prices artificially. Ultimately these break down, and there is then a large and sudden change in the value of money. The bullionist explanation of the rapid fall in prices from 1929 to 1933 is that the accumulated fall in the real costs of production burst upon a competitive world all at once. The restrictions that were imposed by business men on falling prices were removed, and the lower real costs of production manifested themselves in the lower price level.

⁴ J. L. Laughlin, *Money and Prices*, p. 6. For his view on the value of money, see particularly, chap. I.

⁵ J. L. Laughlin, *A New Exposition of Money, Credit and Prices*, II, 696.

According to this theory, not only is the value of money thus determined by the value of bullion, but changes in the value of money are largely, if not entirely, the result of changes in the real cost of producing the goods and services for which money is exchanged. The quantity of money, it is held, has little or no effect upon the value of money. The prices of goods in terms of money are determined before any payments are made; in fact, before any purchases are made. It is only after prices have been fixed, and the goods bought, that the buyer is under necessity of making any payment in money. In the actual business world, the money for the payment of purchases may even be secured from the sale of the goods at a later time; or from bank loans on the security of the very goods that are bought. The quantity of money is regarded as a consequence, not a cause, of the general level of prices.

There is an element of truth in the bullionist theory of money. In discussing the gold standard it was stated that the value of money is always equivalent to the value of the money metal for which it is given or received. But it is probable that the value of money determines the value of gold, rather than the value of gold that determines the value of money. The monetary demand for gold is far greater than the industrial demand; and for this reason the monetary forces affecting the value of gold are more important than the industrial forces.⁶ Nor is it true that there are no factors from the side of gold tending to change its value. These factors do not operate on the supply of gold, which is constant for short periods, but on the demand for gold. The

⁶ Strictly speaking, it is the composite demand that determines the value of gold. Wieser wrote of the value of money: "Its value is the resultant of the joint force of the effect produced by the service of the coin as a medium of exchange and by the industrial uses of the gold." F. Wieser, *Social Economics*, p. 270.

industrial demand for gold varies with the prosperity of the community, increasing and decreasing with corresponding changes in income. The demand for gold as reserves for lawful money and deposit money is subject to great variation. At a time when the danger of a drain on the reserves is large, the demand for gold is increased. Even the demand for gold for the purpose of hoarding is variable, increasing and decreasing with the probable value of gold. The relative fixity of the supply of gold does not assure stability in its value so long as the demand for gold is subject to large and sudden changes.

It seems entirely inadequate to explain short run changes in the general level of prices by similar changes in the real cost of producing the goods and services purchased with money. The technique of production is ordinarily slow in changing, and altho revolutionary changes in production may take place for individual goods, this is of small importance in comparison with the great bulk of goods and services. Even in periods of rapid technical progress, therefore, the decrease in the cost of producing goods in general is not sudden. It cannot account for the large and rapid changes in the price level that are characteristic of our economic society. It is true that the price of a commodity is normally determined by its expenses of production, and that this may be said of goods and services collectively as well as individually. But this gives no indication of the forces determining the value of money at any given time. In the short run, it is the price of a good that determines how far expenses will be incurred in producing it. Further, the expenses of production are themselves determined by the value of money, since they depend upon the monetary remuneration of the factors of production, and these rates of remuneration depend upon the value of money. The bullionist theory of

money cannot be said to offer a satisfactory explanation of the manner in which the value of money is determined, or of the forces that bring about a change in the value of money.

There is a widespread, altho mistaken view, that the bullionist theory of the value of money is that of the classical economists. On the contrary, Ricardo and his successors believed that the value of irredeemable paper money or of debased coin could be maintained at its former value simply by limiting the quantity of such money. "The whole charge for paper money may be considered seignorage. Though it has no intrinsic value, yet, by limiting its quantity, its value in exchange is as great as an equal denomination of coin, or of bullion in that coin. On the same principle, too, namely by a limitation of its quantity, a debased coin would circulate at the value it should bear if it were of the legal weight and fineness, and not at the value of the quantity of metal which it actually contained." ⁷

3. *The Supply of and Demand for Money*

There is a large number of economists who seek the explanation of the prevailing value of money, and of changes in the value of money, in the general economic theory of value. The market value of a good—expressed in terms of money—is determined by the equilibrium of the supply of and demand for the good. There is for every good sold on a market one price at which the quantity demanded is equal to the quantity supplied; and forces are at work tending to direct the market value of a good to this price. Similarly, the value of money in the short run, according to this theory, is determined by the equilibrium of the supply of and demand for money.

⁷ D. Ricardo, *Principles of Political Economy and Taxation*, chap. XXVII.

This approach to the problem of the value of money implies several assumptions that must be considered. Clearly enough, money is regarded as a commodity, the value of which is determined in accordance with the general principles of value. It therefore follows that money has utility and scarcity, and that there is a supply schedule and a demand schedule for money in every community. If this approach to the problem of the value of money is to have validity, these terms must be understood in the usual sense in which they are applied to economic goods, for otherwise the analogy between the determination of the value of money and the value of economic goods is destroyed.

In speaking of the utility of money there are several senses in which the term may be understood. The utility of money is sometimes regarded as the convenience it affords the community in bringing about greater specialization, and the more orderly production, distribution and utilization of the national income. More commonly the term is understood in the sense of the utility of money to an individual. So understood, the utility of money is a derived utility, depending upon the satisfactions secured from the goods purchased with money. In this sense, any change in the value of money must change its utility, a rise in prices decreasing the utility of money, and a fall in prices increasing the utility of money. There can be no analogy between money and commodities in this respect, for the value of a good is determined by its utility, while the utility of money is determined by its value. This peculiarity of the utility of money can be seen more clearly when consideration is given to the effect of an increase in the quantity of money on its marginal utility and total utility. An increase in the quantity of a good diminishes its marginal utility, but increases its total utility. An increase

in the quantity of money, if prices rise proportionally, diminishes the marginal utility of money, but leaves the total utility of money unaffected. This is what is meant when it is said that except during a period of transition the quantity of money in a community is a matter of indifference.

Nor can the scarcity of money be regarded as of the type generally associated with economic goods. The scarcity of economic goods is the result of the limited bounty of nature, or of the real sacrifice that must be incurred in production. The scarcity of money, other than commodity money, is imposed artificially by the monetary authorities of the community for the purpose of regulating the value of money. It is generally accepted that the well-being of the community cannot be advanced by diminishing the scarcity of money—a conclusion that should follow if money is regarded as an economic good—and that it can be advanced by maintaining the proper degree of scarcity of money. These objections to the concepts of utility and scarcity of money are equally applicable to a monetary system using commodity money exclusively, altho the objections are partly overcome by the effects of transferring the money commodity to and from industrial uses.

Is there a demand for money? Undoubtedly the community requires money in transacting its economic affairs. As already indicated, the demand for money in this sense is not for a given number of units of money, but for a means of commanding real resources. What the community demands, therefore, is not a quantity of money, but a quantity of purchasing power. If this demand for purchasing power were a true demand schedule for money, there would be some tendency for the demand to expand with a fall in the value of money, and to contract with a rise in the value of

money. There is, in fact, no such tendency. The quantity of purchasing power the community demands is independent of the value of money, altho not of changes in the value of money, and tends to be constant under ordinary conditions. Whatever variation there may be in the quantity of purchasing power the community demands with changes in the value of money is precisely opposite to that which would be expected with a true demand schedule. There is evidence that the quantity of purchasing power the community prefers to hold tends to increase, at least temporarily, with a rise in the value of money, and to decrease, temporarily, with a fall in the value of money.

A similar difficulty is experienced in attempting to determine what constitutes the supply of money, and whether there is a true supply schedule for money. However the supply of money is defined—whether as the quantity of money, or the quantity multiplied by the velocity—it does not have the characteristics of a true supply schedule. If the supply of money constituted a true supply schedule, the tendency would be for the quantity of money to vary directly with changes in its value, or in extreme instances to remain fixed regardless of the value of money. In fact, a rise in the value of money—lower prices—tends to bring about a decrease in the quantity of money; and a fall in the value of money—higher prices—tends to bring about an increase in the quantity of money. The reasons for this are clear enough. The quantity of deposit money which constitutes the larger part of the money supply of the community is determined by the banking system in response to the demand for bank credit. The willingness of the banking system to extend credit to business men, and the willingness of business men to accept bank credit, are dependent upon the discount rate and the

profitableness of business. For this reason a rise in prices tends to bring about an increase in the quantity of money, while a fall in prices tends to bring about a decrease in the quantity of money. The supply schedule for money thus seems to be precisely the reverse of a true supply schedule.

There is reason to believe that many economists who have accepted the supply and demand approach to the value of money were seeking to strengthen the quantity theories of money by unifying them with the general theory of value. Thus Mill wrote: "The value or purchasing power of money depends, in the first instance, on demand and supply. But demand and supply, in relation to money, present themselves in a somewhat different shape from the demand and supply of other things."⁸ In fact, Mill elaborated one of the quantity theories of money. Similarly, Walker held that the quantity theory of money was a particular form of the general theory that value is determined by the supply of and demand for goods.⁹ The basic assumption of these economists is clearly stated by Professor Gregory: "The quantity theory in its barest form is the application to the field of monetary theory of the supply and demand explanation of prices: quantities of money are contrasted with quantities of goods."¹⁰ There is no sound reason for accepting the identity of the supply and demand theory of money and the various quantity theories of money.

4. *The Quantity Theories of Money*

Most of the supply and demand explanations of the value of money seek to identify the supply of money in some way

⁸ J. S. Mill, *Principles of Political Economy*, Bk. III, chap. VIII.

⁹ F. A. Walker, "The Value of Money," *Quarterly Journal of Economics*, VIII, 62-76, and "The Quantity Theory of Money," *Quarterly Journal of Economics*, IX, 372-379.

¹⁰ *Encyclopedia of the Social Sciences*, X, 608.

with the quantity of money available in the community. Explanations depending upon the identity of the supply of money with the quantity of money are better regarded as particular forms of the various quantity theories of money. The central doctrines of the quantity theories of money may be summarized as follows:¹¹

1. Money circulates because it commands real resources and discharges obligations;
2. All forms of money—commodity money, representative money, managed money—affect the value of money;
3. The value of money is determined by the quantity of money, directly or indirectly;
4. No special theory is needed to explain the value of irredeemable paper money.

By some advocates of the various quantity theories of money these fundamental doctrines are regarded as self-evident, resting upon the peculiar characteristics of money. By others, these doctrines are regarded as conclusions that can be drawn from statistical studies relating the value of money to the quantity of money.

One of the simplest and clearest of the quantity theories of money is that of Professor Cassel, which he calls the scarcity theory of money. For money to have any value it must be useful in purchasing goods, in paying debts, and in performing similar services. The precise value of a unit of money depends upon its scarcity—that is, its limited quantity. The greater the scarcity of money, no other changes having taken place, the greater will be its value; and changes in its value will ordinarily be brought about by changes in the scarcity of money. Scarcity, it is understood, refers not to an absolute amount of money, but to the amount of money

¹¹ Cf. H. S. Ellis, *German Monetary Theory, 1905-1933*, p. 5.

relative to the community's need for money. Of the effect of a change in the quantity of money, Cassel says:¹²

If fresh means of payment are created—whether in the form of legal tender currency or in the form of banking means of payment—additional purchasing power is created. The result must be a rise in prices. We cannot say exactly how great this rise will be. But once a rise in prices having taken place, the genuine need for means of payment will obviously increase in the same proportion. Thus the public will keep so much of the fresh means of payment as it wants at the higher price level. The rest of the freshly created means of payment will flow back to the banks which have created them. The result is that the general level of prices and the total supply of means of payment have both increased in the same proportion.

With this general statement, most advocates of the quantity theories of money would agree. It states that the relationship of the quantity of money to the value of money is direct, and that the cause of changes in the value of money must be sought in changes in its quantity. It emphasizes the relationship between the quantity of money, expenditure, prices, and the community's need for money to carry on its affairs.

The various quantity theories of money, altho agreeing that the value of money is directly related to its quantity, differ as to the means by which this relationship is established. One of the earliest of the quantity theories of money is the mechanical version associated with the views of Professor Fisher. The money payments of a community during a period of time are equal to the quantity of money multiplied by the average number of times each unit is used

¹² G. Cassel, *Fundamental Thoughts in Economics*, p. 145.

during the period. These money payments of the community are necessarily equal in value to all the things purchased with money in the same period. The value of a unit of money is therefore equal to the total quantity of goods purchased divided by the total quantity of the means of payment used. The frequency with which money is used tends to vary slowly, since it is independent of the value of money, of the quantity of money and of the volume of trade. Any change in the quantity of money changes the volume of the means of payment and, if no change takes place in the volume of transactions, the value of money proportionally. The volume of money, it is held, is the only dynamic factor among all the forces affecting the value of money. It alone is subject to rapid change; and it alone is generally the cause of changes in the value of money. This brief statement of one of the quantity theories of money is extended and further considered in the following chapter.

Another important quantity theory of money places emphasis upon the community's need for a quantity of money to carry on its economic affairs, and the manner in which this determines the value of money. For convenience, the community keeps in the form of money sufficient purchasing power to acquire a given quantity of real resources. If at a given level of prices, the quantity of money gives command over more or less real resources than the community wishes to hold in the form of cash balances, purchases will be increased or decreased to adjust these balances to the proper level. Obviously, the community as a whole cannot change its holdings of money by varying its spending, for the expenditures of some are the receipts of others. But a variation in spending will affect prices, and at the higher or lower level of prices, the purchasing power of the entire quantity

of money will be adjusted to the quantity of real resources the community wishes to keep in the form of money. When this equilibrium has been established between the quantity of money, its value, and the cash balances the community wishes to hold, any change in the quantity of money will affect the community's balances and its expenditure; and there will be a tendency for prices to change after a time in proportion to the change in the quantity of money. The manner in which the community's need for cash balances affects the value of money is considered at greater length in a later chapter.

All quantity theories of money recognize the importance of expenditure as one link in the chain of events by which the quantity of money affects its value. It is in purchases that the value of money is determined; and it is only through a change in expenditure that a change in the quantity of money can bring about a change in the price level. It is not surprising that the most recent theories of the value of money place great emphasis on the manner in which variations in the income and expenditure of the community bring about changes in the value of money. Under normal conditions, there is a close relationship between the quantity of money, and the income and expenditure of the community. Changes in the quantity of money affect incomes within a short time; and the community then alters expenditure to conform to changes in income. These adjustments of expenditure that are made because of changes in income, or for other reasons, are the immediate cause of a change in the value of money. There are differences of opinion as to the precise manner in which the income and expenditure of the community are affected by the quantity of money, and as to the manner in which they, in turn, affect the value of money. But the sig-

nificance of this approach to the problem of the value of money is generally admitted; and the most important studies of monetary questions in recent times have been concerned with working out the manner in which the value of money is affected by changes in the income and expenditure of the community. The full consideration of this theory is reserved for a later chapter.

The basic reason for a change in the value of money, according to these theories, is a change in the quantity of money. Generally speaking, a large change is more likely to occur in the quantity of deposit money than in the quantity of lawful money. In this country there is evidence that the quantity of lawful money is to some extent dependent upon the quantity of deposit money. Changes in the quantity of deposit money are chiefly the result of increases or decreases in the loans made by commercial banks to business men. The demand for bank loans is largely determined by the possibility of profitable use of money in production, and this in turn depends upon the rate of discount charged by banks. When money can be used profitably in production, business men secure bank loans, increase their employment of the factors of production, and thus affect the income and expenditure of the community, and to some extent the price level. The manner in which the discount rate charged by banks for loans influences the price level has been given much study in recent times, and this theory will be considered in detail in a later chapter.

The quantity theories of money have one view in common—that the normal effect of a change in the quantity of money is a proportional change in the value of money, after sufficient time has elapsed for the change in the quantity of money to affect the economic life of the community. Many

of these theories are closely related, differing only in the emphasis they give to one or another of the many means by which the effect of the quantity of money upon the price level is worked out. But there is also considerable difference in their views on the meaning of the value of money and its measurement, and on the causal relationship between the many complex factors involved. This difference is sufficiently great to require a distinction between the various quantity theories of money. A full understanding of the central problems of monetary theory requires further analysis of these quantity theories of money.

Chapter IX

The Equation of Exchange

1. *The Assumptions of the Theory*

THE most familiar of the quantity theories of money is the equation of exchange, particularly as stated by Professor Fisher. In its general form, this quantity theory has been known and understood for many years. Fisher writes that "Ricardo probably deserves chief credit for launching the theory." John Stuart Mill stated this quantity theory in his *Principles*, 1848, in very nearly the form in which it is now commonly stated. The theory was first expressed algebraically by Simon Newcomb in his *Principles of Political Economy*, 1885. Even the objections to the theory that are still generally made were first stated long ago.¹ The equation of exchange may therefore be regarded as the first of the quantity theories to be developed. Its most precise statement is undoubtedly that of Professor Fisher, who has done much to elucidate it, to clarify its assumptions, and to test its conclusions. What is hereafter said of the equation of exchange refers to Fisher's views, unless otherwise noted, as stated in his *Purchasing Power of Money*.²

It is obviously true that in any community carrying on business with money, if purchases were made only with

¹ For example, those made by Alfred Marshall in his testimony before the Gold and Silver Commission, 1887. *Official Papers*, p. 34 ff.

² For a summary of Fisher's statement of the quantity theory of money and the equation of exchange, see chap. II, *The Purchasing Power of Money*.

money and money were used only for purchases, the total of money payments in the community would equal the total money value of all goods and services sold. It is likewise true that the total money payments would be equal to the quantity of money multiplied by the average number of times each unit of money was used in purchases; while the total money value of the goods and services sold would be equal to their quantity multiplied by the average of the prices of these goods and services. And finally, it would be true that the average price of these goods and services would be equal to the quantity of money multiplied by the average number of times each unit of money was used, divided by the volume of goods and services sold for money. All this would necessarily be true in a community in which purchases were made only with money and money was used only for purchases.

This series of propositions is more familiar in its algebraic form, altho the algebraic statement is merely a convenient method of summarizing assumptions already made implicitly. In Fisher's equation

$$PT = MV + M'V'$$

P represents the general level of prices prevailing during a period of time, say one year;

T represents the volume of transactions for which money payments are made during the year;

M represents the average quantity of money—lawful money—available during the year;

V represents the velocity of lawful money—the average number of times each unit of money is used in making purchases during the year; and

M' and *V'* represent the average quantity and the velocity of deposit money during the year.

For most purposes all types of money may be grouped together, and the equation can then be written $PT = MV$, where M represents the average quantity of money of all kinds, and V the average velocity of money of all kinds.

The formal validity of the equation is generally not denied. The objections are to the conclusions that are drawn from the equation. According to Fisher and his followers, the volume of transactions and the velocity of money tend to remain constant in short periods; at least, they are independent of the quantity of money and the price level. Only the quantity of money and the price level are supposed to be subject to change in short periods; and of these factors, changes in the quantity of money are said to be independent, while changes in the price level are dependent upon and caused by changes in the quantity of money. This, in brief, is the view of those who hold that the equation of exchange is an explanation of the manner in which the quantity of money determines the price level. The equation itself, of course, cannot show the causal relationship among the factors involved in the determination of the price level.

2. *The Meaning of the Equation*

The general level of prices, P —or the value of money, $\frac{1}{P}$ —is determined by the other factors of the equation, M , V and T . The quantity of money in the equation of exchange consists of the average amount of all means of payment, lawful money and deposit money, during a period of time. There should be no emphasis on lawful money to the exclusion of deposit money; and in Fisher's discussion, recognition is given to the importance of deposit money. But Fisher holds that deposit money is not independent in supply, that it is in fact a function of the quantity of lawful

money. He says that "the inclusion of deposit currency does not normally disturb the quantitative relation between money and prices." That is, the relationship between lawful money and prices is direct, and this relationship is not disturbed by the inclusion of deposit money. The emphasis is thus placed on lawful money as the principal factor in determining prices, deposit money being regarded as a dependent type of money, and by some economists as only a substitute for money. This is probably a mistaken view of the importance of deposit money as an independent factor affecting the value of money.³

A community's holdings of money may be divided into two kinds—lawful money on hand, and deposit money subject to check. For an entire community, the tendency is to hold a convenient proportion of lawful money to deposit money that is relatively constant in normal times. If the proportion of lawful money on hand is too large, some is deposited in banks and converted into deposit money; and if the proportion of lawful money on hand is too small, deposits are withdrawn and converted into lawful money. In order to maintain the convertibility of deposit money into lawful money, banks must limit the supply of deposit money, and must maintain a reserve of lawful money. In this way, it is said, the quantity of deposit money is dependent on the quantity of lawful money. Because in gold standard countries the quantity of lawful money is limited

³ Professor Fisher seems to have changed his view on this question in recent years. In testimony before a Congressional Committee, he said: "In the old days credit was the minor factor, gold still being the basic factor. But to-day the 'tail is wagging the dog'; to-day credit is much more important than gold in magnitude, to-day it is the volume of credit that determines the purchasing power of the dollar—the price level—more than the volume of gold; but both are important factors. In the long run gold is the more fundamental of the two because the credit is merely a pyramid standing on the gold base." *Stabilization Hearings*, 1927, p. 74.

by the reserves of gold, some economists go so far as to say that the entire quantity of money of all kinds—and therefore the price level—is determined by the supply of gold.

It is quite certain that the relationship of gold to money of all kinds, in gold standard countries, is of the limiting, passive type. To some extent the various kinds of money are independent in their quantities, and to exclude deposit money from consideration among the factors affecting the price level would invalidate the conclusion that the value of money is determined by its quantity. Fisher admits that "during periods of transition this relation between money (M) and deposits (M') is by no means rigid." It is a matter of common knowledge that during periods of business depression the supply of lawful money may increase while the supply of deposit money decreases. In fact, the relationship of M' to M is always varying. In periods of expanding business activity the ratio of M' to M rises, and in periods of declining activity it falls. There is no justification for assuming that the relationship of the various kinds of money to each other are so constant that the same result is obtained regardless of how the quantity of money is defined. Deposit money cannot be considered an unimportant factor in the equation of exchange.

The theory of the value of money expounded by Fisher and his followers requires that the quantity of money be determined independently of the other factors in the equation. Altho the quantity of money may vary independently, it is also determined to some extent by the volume of transactions and by the general level of prices. This criticism of a major assumption of this quantity theory of money is important enough to require elaboration at a later point. In the meantime, it may be admitted that large variations in the quantity of money, not of a seasonal or cyclical nature,

are generally independent of the other factors in the equation; while it may be noted that Fisher admits that seasonal variations in the quantity of money are in part the result of variations in the volume of transactions.

The annual velocity of money is the average number of times a unit of money is exchanged for goods in the course of a year; or as it is frequently defined, it is the total money payments in the course of a year divided by the average quantity of money available during the year. The velocity of money is determined by many complex forces, among which are the following:⁴

1. *Habits of the individual:*

- (a) as to thrift and hoarding;
- (b) as to book credit;
- (c) as to the use of checks.

2. *Systems of payment in the community:*

- (a) as to frequency of receipts and disbursements;
- (b) as to regularity of receipts and disbursements;
- (c) as to correspondence between times and amounts of receipts and disbursements.

3. *General causes:*

- (a) density of population;
- (b) rapidity of transportation.

The forces affecting the velocity of money are those characteristic of an advanced industrial society. In general, velocity is greater in industrial than in agricultural and in urban than in rural communities; and it is greatest in large cities where great financial transactions are frequently carried on with relatively small balances of money.

Professor Fisher calculated the annual velocity of lawful

⁴ I. Fisher, *The Purchasing Power of Money*, p. 79.

money by the following indirect method. He found the average quantity of lawful money in use by the community, exclusive of money held by banks. He then determined what proportion of deposits made to demand accounts were in the form of lawful money. In this general manner he determined the total amount of lawful money used annually that passed thru banks. Allowance was then made for the fact that lawful money was used several times before being returned to banks in the form of deposits. The indicated result was that the total use of lawful money was approximately $1 \frac{2}{3}$ times the amount of lawful money deposited to demand accounts in banks. This total use of lawful money was divided by the average quantity of lawful money available for the community, exclusive of money held by banks, and the result was the annual velocity of lawful money.⁵

The velocity of deposit money can be calculated rather easily. From the definition of velocity, it is evident that the velocity of deposit money can be determined by dividing the total use of deposit money during the year by the average amount of deposit money available during the year. The total use of deposit money is shown by the sum of all debits to demand accounts. The average daily balance of all demand accounts at banks shows the average amount of deposit money available. The annual velocity of deposit money is therefore the total debits for the year, divided by the average daily balance during the year. The velocity of deposit money varies in different parts of the country. It is extremely high in New York, in the period from 1919 to 1925 ranging from 68.3 annually in 1921 to 87.7 annually in 1925. It is markedly lower for the country as a whole, in the same period ranging from 24.7 annually in 1921 to 28.8 annually in 1919.

⁵ *Ibid.*, pp. 460-471.

It has been assumed by Professor Fisher and others that the velocity of money is constant and independent—that it does not affect and is not affected by the other factors in the equation of exchange. Fisher's statistical study shows that the velocity of money increased from 1896 to 1909, but he attributes this increase to the forces ordinarily determining the velocity of money. He admits there is a tendency for velocity to change in the course of a business cycle, but he regards this as of small importance. Normally, according to Fisher, the velocity of money is not affected by the volume of transactions or by the price level. As Cassel says of the velocity of money: "When this rapidity of circulation is said to be an independent factor, we mean only that it has independent causes which lie outside the problem of the fixing of prices."⁶ As will be shown in the next chapter, the velocity of money is very closely related to changes in the price level. It may be true that the velocity of money is nearly constant under a stable price level, but so long as instability is characteristic of prices, an assumption that the velocity of money is independent of the price level invalidates any conclusion regarding the forces determining the value of money. The evidence is clear that the velocity of money is also affected by the volume of transactions. During periods of great business activity, the velocity of money increases; and during periods of little business activity, the velocity of money decreases.

The volume of trade, which with the quantity of money and the velocity of money determines the general level of prices, is defined by Fisher as a "stream of transferred rights in goods." The volume of trade is affected by many complex forces, among which are the following:⁷

⁶ G. Cassel, *A Theory of Social Economy*, p. 426.

⁷ I. Fisher, *The Purchasing Power of Money*, pp. 74-75.

1. *Conditions affecting producers:*
 - (a) geographical differences in natural resources;
 - (b) the division of labor;
 - (c) knowledge of the technique of production;
 - (d) the accumulation of capital.
2. *Conditions affecting consumers:*
 - (a) the extent and variety of human wants.
3. *Conditions affecting producers and consumers:*
 - (a) facilities for transportation;
 - (b) relative freedom of trade;
 - (c) character of monetary and banking systems;
 - (d) business confidence.

With the exception of business confidence, these forces are not subject to rapid change in short periods. For this reason, the volume of trade is assumed to be determined independently of the other factors in the equation of exchange.

The volume of trade is not the quantity of goods and services purchased for final use; but the total of all transactions involving the use of money. The miscellaneous nature of the transactions included in the volume of trade is shown by the manner in which Fisher calculated the index number of the volume of trade. He took a weighted average of the volume of internal commerce; exports and imports, sales of stock, railroad freight carried, and postal receipts.⁸ It

⁸ Professor Kemmerer made a statistical study of the equation of exchange to test the validity of this form of the quantity theory of money. In calculating the index number of the volume of transactions he took an average of the index numbers of the following: population, tonnage entered and cleared, exports and imports of merchandise, post office revenues, gross earnings from railroad operations, railroad freight carried, Western Union receipts, consumption of pig iron, coal, wheat, corn, cotton, wool, wines and liquors, and the market value of reported sales on the New York Stock Exchange. E. W. Kemmerer, *Money and Credit Instruments in Their Relation to General Prices*, pp. 130-131. Obviously,

cannot be denied that an index number of this sort measures variations in business activity. But clearly this volume of trade is related only approximately to the goods and services purchased for consumption; and an index number of prices for transactions cannot be considered a satisfactory measure of the value of money in purchasing goods and services for final use.

The volume of transactions is assumed by Fisher to be independent of the other factors in the equation of exchange. "The stream of business depends on natural resources and technical conditions, not on the quantity of money." It was shown in earlier chapters that variations in the general level of prices are probably the cause of variations in the volume of industrial production. Fisher admits that the volume of transactions may under some conditions be affected by the price level, but he holds that such conditions are abnormal. The usefulness of a theory of the value of money is materially lessened if it disregards business cycles, and considers the fluctuations in business activity an abnormal feature of economic life. On the contrary, it seems probable that the value of money is always a factor affecting the volume of production, altho under conditions of economic equilibrium, its effect is to maintain production at a level determined by the efficiency of the factors of production. Since it is only when prices are constant that the volume of trade may be said to be independent of the price level, it becomes logically impossible to explain changes in the general level of prices by any theory assuming the independence of the volume of production and prices.

this index number is open to the same objections as that of Fisher. Under any circumstances it is not clear why index numbers of money values should be included in determining an index number of transactions.

The average level of prices that is determined by the equation of exchange is probably a good measure of the price level of the transactions involved. But it cannot be considered a measure of the value of money in purchasing goods and services for consumption. The index number of prices suitable to this equation was computed by Fisher by combining an index number of prices of goods at wholesale, an index number of hourly rates of wages, and an index number of the prices of stocks.⁹ An index number of general prices, calculated in this manner, can give only an approximation of the purchasing power of money over goods and services intended for consumption.

3. *Some Criticisms of the Theory*

In explaining the value of money by the equation of exchange, it is assumed that the volume of transactions and the velocity of money are not affected by the quantity of money or the level of prices; and that variations in the quantity of money are the cause of variations in the level of prices. The volume of transactions is assumed to be determined by the supply and efficiency of the factors of production, and not to be subject to large change in short periods, except during business cycles. The velocity of money is assumed to be determined by the customs of the community, and ordinarily to be nearly constant for long periods. Only the quantity of money and the level of prices are regarded as subject to comparatively large changes in short periods; and of these changes, that in the quantity of money is said to be independent and the cause of changes in the level of

⁹ Compare the index numbers combined by Fisher to secure a general index number of prices, with the index numbers combined by Snyder, p. 100, above. The index number used by Kemmerer in his study was computed in almost the same manner as Fisher's.

prices. Upon the validity of these assumptions depends the usefulness of the equation of exchange as an explanation of the forces determining the value of money.

It is almost certain that the volume of transactions is not determined exclusively by the supply and efficiency of the factors of production. Studies of cyclical and secular variations in production indicate that changes in the value of money are an important factor in determining the volume of production. Nor are the variations in production induced by changes in the value of money of a small order. From June to December, 1929, the volume of industrial production decreased by more than 20 per cent, and from 1929 to 1933 by nearly 50 per cent. With such large changes in industrial production, it would be a serious error to assume that the volume of transactions is determined independently of the other factors in the equation of exchange. It is undoubtedly true that the volume of production is normally determined by the supply and efficiency of the factors of production; but the proportion of the factors of production actually employed is dependent upon their rates of remuneration and the level of prices for their output. When equilibrium prevails, there is a tendency for changes in production to depend upon changes in the supply and efficiency of the factors of production. But equilibrium seldom prevails for an extended time.

Similarly, it is questionable whether the quantity of money is independent of other factors in the equation of exchange. Fisher admits that during periods of crop moving, and perhaps at other times, the quantity of money is to some extent affected by the volume of transactions. Nevertheless, he understates the close relationship that exists in short periods between transactions and the quantity of money. "It deserves

to be said," observes Professor Taussig, "that the term M' (deposits) in his equation is not entirely independent, but is in some degree a function of T . . . That is, for short periods—nay, for periods of some years—an increasing volume of trade tends of itself to bring about an increasing volume of deposits. . . The phenomenon shows itself most strikingly in stock exchange loans, especially in a center like New York. There the business creates for itself quasi-automatically its own medium of exchange."¹⁰ The view of Fisher that the quantity of money of all kinds is independent of other factors in the equation of exchange assumes a rigidity in the conditions under which money is supplied that does not exist. In fact, there is considerable elasticity in the monetary system. The quantity of money available at any time is determined by many complex forces, and among these forces are not only the volume of transactions, but also the level of prices and the velocity of money. The variations in the quantity of money are independently limited; but within these limits the quantity of money is related to other factors in the equation of exchange.

It has been indicated that Fisher regards the velocity of money as independent and nearly constant. On the other hand, Professor Pigou and others hold that the velocity of money varies with the volume of production and the level of prices. The evidence seems to be that in England the velocity of money varies more than in proportion to the volume of transactions, and that even in the United States the velocity of money varies in proportion to the volume of production. It has been an important argument of those explaining the determination of the value of money by the equation of exchange that the volume of transactions and

¹⁰ From a symposium on Fisher's views, reprinted in C. A. Phillips, *Readings in Money and Banking*, pp. 200-201.

the velocity of money are nearly constant for short periods, and that the only dynamic factors are the quantity of money and the level of prices. Altho these assumptions are incorrect, they do not necessarily invalidate the equation of exchange and the conclusion drawn from it. As Snyder has shown, in the United States, the velocity of money and the volume of transactions change proportionally, so that their variations are compensatory; and altho neither V nor T is constant, $\frac{V}{T}$ is constant.

The velocity of money is not only affected by the volume of transactions, but also by changes and expected changes in the value of money. Any large change in the quantity of money affecting the price level is certain to have a tremendous effect upon the velocity of money. To take an unusual instance, the velocity of money in Germany increased by more than 4,000 per cent during the period of rapid inflation, from December, 1920 to August, 1923. The more sensitive a community is to changes in the price level, the greater will be the variability of the velocity of its money. The assumption that the velocity of money is constant, or even that it varies proportionally with the volume of transactions, is probably not valid.

"The objectors to the quantity theory have maintained that prices should be regarded as causes rather than as effects."¹¹ Fisher and others hold that high prices, for instance, cannot cause an increase in the quantity of money in a gold standard country. A rise in prices discourages the production of gold, diverts gold into non-monetary uses, and induces an export of gold.¹² For these reasons, it is said, a rise in prices

¹¹ I. Fisher, *The Purchasing Power of Money*, p. 169.

¹² D. A. Barker, *The Theory of Money*, chap. VII. Of course, it is not high prices, but relatively high prices, that bring about an export of gold.

cannot cause an increase in the quantity of money. However, not all money is gold; and the supply of lawful money and of deposit money is not necessarily affected by prices in the same way as the supply of gold. Higher prices with larger profits increase the demand for bank loans and the rate of interest on such loans. A rise in interest rates induces banks to increase the quantity of deposit money by utilizing the elasticity in the monetary system. The higher discount rate also encourages imports of gold to take advantage of the favorable market for short-term loans. In this way, a rise in prices will tend to bring about an increase in the quantity of money. The degree to which prices can affect the quantity of money is limited by the laws and customs relating the supply of money to gold. Even in gold standard countries, this limit is never absolute and rigid, and in normal times there is considerable variation in the supply of money of all kinds relative to gold.

It is quite certain that none of the factors in the equation of exchange is entirely independent or entirely passive, altho the possibility of independent variation is probably greatest for the quantity of money. The effect of a change in any factor in the equation depends upon the magnitude of the change and upon business conditions at the time. An increase in the quantity of money during a business revival increases cash balances until they are excessive. As these excessive balances are spent or invested, there is a tendency for the price level to rise. A rise in prices increases profits, and induces business men to expand their demand for bank loans and to increase the employment of the factors of production. In the end, an increase in the expenses of production relative to prices brings about a decrease in production and employment, and a repayment of bank loans. Prices fall and

profits diminish, and output and the quantity of money are decreased. All the factors in the equation of exchange are thus inter-related. There is no way of changing one without affecting all. The effect is not equally strong in all directions; but some effect there is, and it cannot be neglected. To assume the independence of some factors, and the passivity of others, is to give a mistaken view of the manner in which the purchasing power of money is determined.

4. *Statistical Evidence of the Equation of Exchange*

The equation of exchange has frequently been put to statistical test. It has already been shown that there is a striking correspondence between variations in Snyder's index number of general prices and the quantity of lawful money in circulation (page 124, above). Cassel has shown the same relationship between the quantity of notes in circulation and the price level, in Sweden. The relationship, altho close, is not precise; and it is less striking than the correspondence between Snyder's index number of general prices and money in circulation in the United States. One reason is that Snyder's index number is not only for the prices of goods, but also for other transactions involving the use of money; while Cassel's index number is for an average of wholesale prices and food prices, that is, for goods exclusively. The period covered by Cassel's study was subject to greater disturbances from non-monetary as well as monetary forces than the period covered by Snyder's study. The relative note circulation and prices in Sweden from 1915 to 1920 follow:

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Relative Note Circulation and Prices in Sweden, 1915 to 1920 *

Year	Quarter	Price Index	Note Index
1915	1st Quarter	125	133
	2nd Quarter	132	130
	3rd Quarter	138	131
	4th Quarter	146	136
1916	1st Quarter	155	144
	2nd Quarter	161	151
	3rd Quarter	177	156
	4th Quarter	192	168
1917	1st Quarter	207	185
	2nd Quarter	213	201
	3rd Quarter	228	210
	4th Quarter	253	233
1918	1st Quarter	281	260
	2nd Quarter	340	285
	3rd Quarter	340	307
	4th Quarter	371	339
1919	1st Quarter	362	340
	2nd Quarter	341	328
	3rd Quarter	331	313
	4th Quarter	321	314
1920	1st Quarter	327	316
	2nd Quarter	338	320
	3rd Quarter	347	326
	4th Quarter	324	322

* 1913 = 100. G. Cassel, *Money and Foreign Exchange after 1914*, p. 58.

The tendency for prices to rise more rapidly than the quantity of money was in large part due to the increased velocity of money induced by changes in the quantity of money.

Professor Fisher has calculated the magnitude of the various factors in the equation of exchange. He finds the following relative changes in the factors in the equations for the years 1896 and 1909.

*Year	M	M'	V	V'	T	P	MV	$M'V'$	PT
1896.....	100	100	100	100	100	100	100	100	100
1909.....	187	252	116	150	191	159	217	375	304

* I. Fisher, *The Purchasing Power of Money*, p. 290.

The discrepancy in these figures can be seen by comparing a weighted average of $MV + M'V'$ with PT . The index relative for $MV + M'V'$ is 353, while for PT it is only 304. The same difficulty of calculating the factors in the equation of exchange can be seen by comparing the index number of general prices calculated directly and indirectly.

Index Numbers of Prices, 1896 to 1909 *

Year	Directly (P)	Indirectly $\frac{(MV+M'V')}{T}$	Year	Directly (P)	Indirectly $\frac{(MV+M'V')}{T}$
1896.....	63	54	1903.....	87	75
1897.....	64	52	1904.....	85	81
1898.....	66	56	1905.....	91	83
1899.....	74	69	1906.....	97	90
1900.....	80	68	1907.....	97	86
1901.....	84	76	1908.....	92	87
1902.....	89	82	1909.....	100	100

* 1909 = 100. I. Fisher, *The Purchasing Power of Money*, p. 293.

The margin of error is evidently quite large, even after allowing for the statistical difficulty of calculating the magnitude of the factors.

Even more interesting is Fisher's analysis of the relative importance of the various factors in the movement of prices from 1896 to 1909. Disregarding changes in the volume of transactions, he finds that if M had not changed, and other factors had changed as they did, the price level would have been 45 per cent lower; if V' had not changed, and other factors had, the price level would have been 28 per cent lower; if $\frac{M'}{M}$ had not changed, and other factors had, the price level would have been 23 per cent lower; if V had not changed, and other factors had, the price level would have been 1 per cent lower. It is very questionable whether this analysis bears out the views expressed by those holding this quantity theory of money. The increase in the quantity of lawful money was undoubtedly an important factor in the price movement between 1896 and 1909. Nevertheless, it was less important than the change in the quantity and velocity of deposit money. Fisher's analysis seems to indicate that the most important single cause of price changes is probably the expansion of the quantity of deposit money, and the increase in its velocity; and this cause is not independent of changes in the volume of production and in the price level.

5. Concluding Observations

The criticism has hitherto been on the inter-relation of the factors of the equation of exchange. There are, however, fundamental objections to the use of the equation of exchange as a device for indicating the nature of the forces determining the value of money. These objections are particularly concerned with the concepts represented by the symbols P and T . First, money is not used solely for purchasing goods and services, for money may also be used for

paying debts; and purchasing is not done solely with money, for purchases may be made on credit. Second, goods and services, the symbol T , cannot be extended to include the purchase of money claims, that is, financial transactions. Third, the value of money is not the average magnitude of all purchases and payments, but only the average price of such goods and services as are purchased for use. All three objections are closely related, and are aspects of the major objection that the equation of exchange does not concern itself with the determination of the value of money, but with the average magnitude of money transactions of all kinds.

The first objection has been made by Professor Mitchell and others. The money payments of a given period are not entirely related to the transactions of the same period. Production goes on at one time, buying and selling of the products at a later time, and payment for the transactions at a still later time. Part of the purchases of 1934 were paid for in 1933 and part were paid for in 1935; and some of the payments in 1934 were for purchases of 1933 and some for purchases of 1935. The MV and PT of a given year do not refer to precisely the same transactions. The objection becomes increasingly important as the period for which the equation is taken is shortened. This would indicate that the equation of exchange is more nearly valid for long than for short periods. It may also account for some of the statistical discrepancies in calculations of the factors in the equation of exchange.¹³

The objection sometimes made to the nature of the transactions and the money payments included in the equation of exchange is even more important. These transactions include,

¹³ W. C. Mitchell, *Business Cycles*, pp. 130-131.

writes Hawtrey, "not only sales of goods and services, which contribute to form the price level, but dealings in credit instruments and rights to receive money. When a pecuniary right, such as a bill of exchange, or a bond or debenture, is sold for money, the transaction throws no light on the purchasing power of money." ¹⁴ It can be argued that financial transactions ought not to be omitted. Nevertheless, it seems quite certain that purely financial transactions have been given unduly great weight in the equation of exchange.

The third and most important objection is that the value of money determined by the equation of exchange is not the purchasing power of money but its transaction value. The great bulk of the payments included in the equation of exchange is related to industrial, commercial and financial transactions. The transactions related to the purchase of goods and services for consumption are only a small part of the payments included in the equation. It is therefore unlikely that the value of money determined by the equation of exchange is its purchasing power over goods and services for use. "The more accurately we calculate P ," says Keynes, "the clearer does it become what a hotch-potch standard the Cash-transactions Standard is and how unreliable as a guide to the Purchasing Power of Money." ¹⁵

¹⁴ R. G. Hawtrey, *Currency and Credit*, p. 37.

¹⁵ J. M. Keynes, *A Treatise on Money*, I, 236.

Chapter X

Cash Balances and the Price Level

1. *The Need for Balances of Money*

It has been stated that one of the characteristics of money is its power to command real resources. It was indicated that this characteristic of money accounts for the readiness with which people exchange their goods and services for money, and keep in their possession or at their call a quantity of money. The power to command real resources makes an equivalent money value more desirable, in many ways, than the actual resources for which it will later be exchanged; for there is great convenience in holding command over real resources while postponing possession which may require the provision of special facilities for storage. Further, keeping a quantity of money on hand or at call permits postponement of the decision on what goods and services are to be purchased until the most satisfactory choice can be made. And, of course, balances of money must be accumulated in anticipation of obligations that may become due.

Every individual in a specialized society finds it necessary and convenient to keep on hand and at call that quantity of money that will purchase the real resources he is likely to need before his money holdings can be replenished. This quantity of money is not a fixed number of units, for it varies with the value of money; and at higher prices the community needs a larger number of units on hand and at call than it requires at a lower level of prices. In adjusting their money

holdings to their needs, the people of a community determine the velocity of money. "Changes in the rapidity of circulation of money are themselves incidental to change in the amount of ready purchasing power which the people of a country find it advantageous to keep in their own holding."¹ The forces that influence the quantity of purchasing power a community finds it convenient and advantageous to keep in the form of money are the income, the wealth, and the business habits of the community, and the stability of the value of money. Every receiver of income keeps a balance of money that suffices to purchase during the period separating his income receipts, the goods and services of which he customarily has need, together with an allowance for unexpected purchases. When a person finds his holdings of money in excess of his needs, he spends part of his money resources on consumers' goods from which he can secure an income of gratification, or he invests part of his money resources in capital goods or securities from which he can secure a money income.

Similar considerations guide a business man in determining what part of his business assets to retain in the form of money. He keeps on hand or at call a supply of money sufficient to provide for the variable rate at which his receipts and his payments accrue. In part he expects to meet his temporary requirements by borrowing from banks and other sources, and this influences his holdings of money. "By instinct and experience he balances the benefit against the loss of a large holding: he knows that, if he keeps too little purchasing power at his command, he will be frequently brought into straits; and that if he keeps an inordinate quantity, he will diminish the material sources of his income, and yet may

¹ A. Marshall, *Money, Credit and Commerce*, p. 43.

find but few occasions on which he can turn the whole of his ready purchasing power to any great advantage.”² Precisely the same motives guide a bank in determining what proportion of its resources to hold in the form of lawful money and reserve deposits with the central bank. It wishes to retain a quantity of lawful money and bank reserves sufficient to meet the demands for cash payments and for its adverse clearing balances; but it does not wish to deprive itself unnecessarily of an opportunity to extend its holdings of income earning assets. Thus, among all persons and businesses using money there are forces tending to determine the most economical balances of money to be kept on hand and at call.

The desire of a community to hold command over real resources in the form of money is determined by the advantages of using money in this way. Every person tends to adjust his balances of money to that point where the net advantage of holding additional money to be spent at a more convenient or more valuable time, is equal to the disadvantage of being deprived of the psychic or money income that additional money spent on consumers' goods or invested in capital goods or securities would yield. If it is expected that the value of money will rise, the advantage of holding money increases, and people try to expand their balances of money. The attempt to increase holdings of money by the people of the community induces a rise in the value of money. Conversely, if it is expected that the value of money will fall, the advantage of holding money decreases, and people try to contract their balances of money. The attempt to decrease holdings of money by the people of the community induces a fall in the value of money. Each change in the customary

² A. Marshall, *Money, Credit and Commerce*, pp. 46-47. Cf. E. Cannan, *Modern Currency*, p. 12.

holding of money brings disadvantages of one kind or another, and these disadvantages are greater for large than for small changes in cash balances. This analysis applies not only to the holding of money, but to some extent also to the ownership of claims expressed in terms of money, such as bonds, mortgages and debts of all kinds.

From this approach of Alfred Marshall, the Cambridge economists—Pigou, Keynes and Robertson—have developed equations for a quantity theory of money that emphasize these forces in the determination of the value of money at any given time. The total value of a community's supply of money depends upon the community's desire to keep command over real resources in the form of money. The quantity of money in a community is determined by many forces—by the laws under which its monetary system is managed, and if it is a gold standard country, by the world's supply of monetary gold, and by its position in international trade and international finance. Whatever the quantity of money in a country, its total value depends upon the real purchasing power people wish to command by their holdings of money; and this is related to the wealth, the income, and the money habits of the community, and to prospective changes in the value of money. Altho these forces exert some influence upon the community's need for purchasing power in the form of money, they are all subject to variation. Therefore, the quantity of money a community requires is elastic and never rigid, and it varies with the net advantages of holding balances of money.

It is very difficult to say what the total value of a community's supply of money should normally be. There are estimates of Petty and others relating the community's need for money to its income and its wealth. Adam Smith said it

was impossible to determine precisely what the total value of a community's money should be altho, he added, it had been estimated at a fifth, a tenth, a twentieth, and a thirtieth of the national income. Jevons agreed with Smith, for he said that "no one can tell how much currency a nation requires." Marshall assumed in an illustration that a community's need for money is equal to one-tenth of its income and one-fiftieth of its wealth. Keynes estimates the normal holdings of personal demand deposits at a tenth to a fifteenth of the national income, and the holdings of all deposits, including time deposits, at one-half the national income. Robertson estimates the total value of money of all kinds in England at approximately one-half the national income. There is obviously no fixed relation between the quantity of money in a community and its annual income, for it varies from country to country and from time to time, depending on all the factors affecting the velocity of money.³ In the United States in 1926—which may be regarded as a fairly typical year—the total quantity of lawful money in circulation, exclusive of money held by the treasury and by the Federal Reserve banks, was approximately one-sixteenth of the national income. In addition to this lawful money, the people held a quantity of deposit money—demand deposits

³ For these estimates, see A. Marshall, *Money, Credit and Commerce*, p. 47 and p. 44; W. S. Jevons, *Money and the Mechanism of Exchange*, p. 335; J. M. Keynes, *A Treatise on Money*, I, 230; and D. H. Robertson, *Money*, p. 39.

N. W. Senior also discussed the quantity of money a country requires. He said: "It is obvious, in the first place, that the whole quantity of money in a community must consist of the aggregate of all the different sums possessed by the different individuals of whom it is constituted.

"And what this quantity shall be must depend partly on the number of those individuals; partly on the value in money of the aggregate of their respective incomes; and partly on the average proportion of the value of his income which each individual habitually keeps by him in money." *The Value of Money*, p. 11.

subject to check—equal to slightly more than one-fourth of the national income. The amount of lawful money the people of the United States require varies considerably, being much above one-sixteenth of the national income during periods of depression, and somewhat below one-sixteenth during periods of great prosperity. The quantity of deposit money the people of this country require is less variable, being somewhat more than one-fourth of the national income at all times.

2. *Cash Balances Equations*

This relationship between the total quantity of money in a community, and the desire of the people to hold command over real resources in the form of money, can be expressed by algebraic equations. Professor Pigou was probably the first of the Cambridge economists to give these concepts algebraic form. The fundamental principle is the same in all cash balances equations. On one side there is a quantity of money in the community determined, in part, independently of the community's desire to hold command over real resources in the form of money. On the other side there is a quantity of real resources over which the community wishes to hold command in the form of money determined, in part, independently of the quantity of money in the community. The value of one unit of money will be that proportional part of the real resources the community thus chooses to hold that one unit of money bears to the total quantity of money; or conversely, the price of one unit of real resources will be that proportional part of the whole quantity of money that one unit of real resources bears to the total quantity of resources the community chooses to command with its holdings of money.

Instead of showing the money price of a unit of real resources, Professor Pigou in his cash balances equation shows

the value of a unit of money, that is, the number of units of real resources that a unit of money will buy. His equation, therefore, is the reciprocal of an equation for the price level. Pigou assumes that the quantity of real resources over which a community holds command in the form of money is a constant proportion of the real resources it enjoys in a period of time—that is, its real income. In fact, the quantity of real resources a community commands with its holdings of money, altho related to income, as Pigou implies, and related to wealth, as Marshall states, and also related to the business habits of the community, is in part independent of these influences, and is better regarded as an independent variable. In normal times, Pigou's assumption is valid—the quantity of real resources a community commands with its holdings of money is a fairly constant proportion of its real income.

It is on the following assumptions that Pigou bases his cash balances equation. "Let

R be the total resources, expressed in terms of wheat, that are enjoyed by the community whose position is being investigated;

k the proportion of these resources that it chooses to keep in the form of titles to legal tender; and

P the value, or price, per unit of these titles in terms of wheat. Then the demand schedule just described is represented by the equation

$$P = \frac{kR}{M}."$$
⁴

Allowance can be made in the equation for the community's preference to hold part of its cash balances in the form of claims against bankers—that is, deposit money.

⁴ A. C. Pigou, *Essays in Applied Economics*, p. 177.

Keynes approached the problem in a similar manner in discussing the quantity theory of money in his *Tract on Monetary Reform*. He recognized that the total value of a community's supply of money is related to its desire to hold command over real resources in the form of money; and he held that "the amount of this purchasing power depends partly on their wealth, partly on their habits." There is no indication whether Keynes used wealth to mean capital or income, or both. The real resources that the community wishes to be able to purchase with its money he designated as a quantity of consumption units, each unit being composed of a "collection of specified quantities of their standard articles of consumption or other objects of expenditure; for example the kinds and quantities of articles which are combined for the purpose of a cost-of-living index number." This relationship can be expressed in the form of an equation,

$$n = p(k + rk'), \text{ where}$$

n is the quantity of lawful money and bank reserves in the community;

p is the price of a consumption unit;

k is the number of consumption units, as defined above, that the community wishes to command with its holdings of lawful money;

k' is the number of consumption units that the community wishes to command with its holdings of deposit money; and

r is the proportion of deposits that is covered by a reserve of lawful money and reserve deposits with the central bank.

So long as k , k' and r remain unchanged, the price level, p , will vary proportionally with changes in the quantity of lawful money and reserves, n .⁵

Keynes does not believe that the relation of money to

⁵ J. M. Keynes, *A Tract on Monetary Reform*, pp. 74-87.

prices is such that a change in the quantity of money necessarily causes a proportionate change in the level of prices. It is frequently assumed that n , the quantity of lawful money, is an independent variable in relation to k , the quantity of resources the community commands with its holdings of lawful money, r , the ratio of bank reserves to demand deposits, and k' , the quantity of resources the community commands with its holdings of deposit money. Keynes admits that this is probably true in the long run; but in any short period, a change in n is likely to have an effect on k , k' and on r . This effect is greater, proportionally, for large than for small changes in n . For some time a small change in the quantity of money will have only a slight effect on prices, probably less than in proportion to the change in the quantity of money, for there is a rigidity in prices that cannot be disregarded. But a large change in the quantity of money will cause a considerable change in the community's desire to hold command over real resources in the form of money—a rise in prices decreasing, and a fall in prices increasing, the community's preference for holding money.

Altho Keynes was an advocate of this form of the quantity theory of money when he wrote in 1923, he now holds that the assumptions of this theory are invalid. The Cambridge equation, he now believes, gives a value of money, just as Fisher's equation gives a value of money, but it does not give the value of money in purchasing goods and services for consumption. There is an implication in the cash balances equations that money is held only to secure consumers' goods. This is incorrect, for money is also kept to finance industrial and financial transactions. Keynes therefore conceives of a price level of transactions for which cash balances

are used; the various real transactions being weighted according to their requirements of balances of money.⁶

Robertson, in his equations, had already recognized the criticisms Keynes later made. Robertson assumes that the community holds a quantity of money sufficient to buy that proportion of the national income that it wishes to hold in the form of money; and a quantity of money sufficient to conduct its annual real transactions. These two needs and the quantity of money determine the income price level and the transaction price level of the community. The relationship can be expressed in two equations. The first, the income price level equation, is

$$P = \frac{M}{KR}, \text{ where}$$

P is the income price level;

M is the quantity of money in existence;

R is the real annual national income; and

K is the proportion of R which people wish to hold enough money to buy.

The second, the transaction price level equation, is

$$P' = \frac{M}{K'T}, \text{ where}$$

P' is the transaction price level;

M is the quantity of money in existence;

T is the real annual volume of transactions; and

K' is the proportion of T which people wish to hold enough money to conduct.

Except for the definition of M as the quantity of money in existence, there can be no objection to these equations. It

⁶ J. M. Keynes, *A Treatise on Money*, I, 224.

would seem to be necessary, however, to separate the money held for the purpose of securing income, and the money held for the purpose of conducting business. The use of money for these purposes is separated by Keynes who divides deposit money into income deposits and business deposits.

Robertson, like Keynes, recognizes the effect of changes in the quantity of money on other factors in his equations. An increase in M that continues, and that affects P , tends to increase the real annual income and the real annual volume of transactions so long as some factors of production are not fully employed. This prevents the income price level and the transaction price level from rising in proportion to the increase in the quantity of money. Obviously, the increase in the national income from the stimulus of higher prices cannot continue indefinitely; and when this increase in production is halted, prices tend to rise in proportion to the increase in the quantity of money. On the other hand, a fall in the value of money with an increase in the quantity of money may decrease the proportion of the real annual income and the real annual volume of transactions that the community wishes to hold enough money to buy and to conduct, so that prices may rise more than in proportion to the increase in the quantity of money. Robertson also shows that his equations can be modified to take in present price quotations for transactions to be completed in the future, an objection previously made to the equation of exchange.⁷

3. *Statistical Evidence*

The cash balances equations cannot be tested statistically quite so easily as the equation of exchange. There are no

⁷ D. H. Robertson, *Money*, Appendix A, pp. 195-196.

records indicating, directly, the amount of real income or the volume of real transactions the community wishes to hold enough money to buy and to conduct. However, these figures can be determined indirectly from the price level and the quantity of lawful money and deposit money. Keynes calculated the magnitude of the factors in the cash balances equation for England for October, 1920 and October, 1922. During this two-year period the price level fell by one-third, while the quantity of lawful money, including reserves of banks, and the quantity of deposit money fell only 15 per cent. The comparative figures are:

	Price Index	Lawful Money and Reserves	Bank Deposits
October, 1920	150	£585 million	£2,000 million
October, 1922	100	£504 million	£1,700 million

These figures can be substituted in Keynes's first cash balances equation

$$n = p(k + rk'), \text{ where}$$

n is the quantity of lawful money and bank reserves;

p is the price level;

k and k' are the number of consumption units the community wishes to hold enough lawful money and deposit money to purchase; and

r is the ratio of bank reserves to deposit money.

The equivalents of the symbols then become:

	n	p	k	k'	r
October, 1920	585		230	1333 1/3	.12
October, 1922	504		300	1700	.12

The chief cause of the fall in prices was not the decrease in the quantity of money, but the increase in the quantity of real resources the community wished to command with its holdings of money. The change in the quantity of money was $\frac{2}{3}$ as important as the change in the real resources the community chose to command with its money. To a large extent the increase in the real resources the community held (k and k') was the result as well as the cause of falling prices.⁸

The rapid change in the quantity of real resources over which communities hold command in the form of money, and its effect on prices, is more evident in the European countries that went thru a period of tremendous increase in their note issues. The following table shows the gold value of the note issue of Austria at various dates:

Date*	Volume of Note Issue, Thousand Million Paper Krone	Number of Paper Krone = 1 Gold Krone	Value of Note Issue, Million Gold Krone
June, 1920	17	27	620
December, 1920	30	70	430
December, 1921	174	533	326
March, 1922	304	1,328	229
June, 1922	550	2,911	189
September, 1922	2,278	14,473	157
December, 1922	4,080	14,473	282
March, 1923	4,238	14,363	295
August, 1923	5,557	14,369	387

* J. M. Keynes, *A Tract on Monetary Reform*, p. 52.

As the note issue was increased rapidly, prices rose more than proportionally, and the total gold value of the note issue decreased. After September, 1922, when the increase in

⁸ J. M. Keynes, *A Tract on Monetary Reform*, pp. 83-84.

the note issue was slackened, the gold value of the krone was stabilized, and the total gold value of the note issue increased steadily.

Even greater was the rapid variation in the gold value of the German note issue during this period, as shown in the following table:

Date *	Volume of Note Issue, Thousand Million Paper Marks	Number of Paper Marks = 1 Gold Mark	Value of Note Issue, Million Gold Marks
December, 1920	81	17	4,800
December, 1921	122	46	2,700
March, 1922	140	65	2,200
June, 1922	180	90	2,000
September, 1922	331	349	900
December, 1922	1,293	1,778	700
February, 1923	2,266	11,200	200
March, 1923	4,956	4,950	1,000**
June, 1923	17,000	45,000	400
August, 1923	116,000	1,000,000	116

* J. M. Keynes, *A Tract on Monetary Reform*, p. 51.

** A temporarily successful attempt was made to raise the foreign exchange value of the mark at this time.

The rapid changes in the gold value of the total note issue indicate how variable is the quantity of real resources the community chooses to command with its holdings of money in a period of changing prices. In August, 1923, the total value of the German note issue was only \$27 million, less than fifty cents per capita. When the value of the community's total holdings of money has fallen so low, a government can secure very little real purchasing power by further issues of notes, and the time becomes favorable for stabilization. It was at such times that the note issue was put upon a new basis in Austria, Russia and Germany.

4. *Some Objections to the Cash Balances Theory*

The differences between the cash balances equations and Fisher's equation of exchange are not so fundamental as they seem. It is the purpose of the cash balances equations to indicate the forces determining the value of money in purchasing goods and services for consumption. This is suggested by Pigou's measurement of real resources in terms of wheat, and by Keynes's use of the concept of a consumption unit. In fact, the cash balances equations do not measure the value of money in purchasing goods and services for final use, for they do not separate the cash balances used in transacting business and the cash balances used in purchasing real income. It is therefore probably true, as Keynes later said, that the cash balances equations and Fisher's equation both measure the transaction value of money. It has even been admitted by the Cambridge economists that the two types of equation are different views of the same phenomenon. The cash balances equations are concerned with the value of money at a given moment of time—what Robertson calls the value of "money sitting." The equation of exchange is concerned with the average value of money during a period of time, presumably a year—what Robertson calls the value of "money on the wing."

The equation of exchange places emphasis on the quantity of money, and uses the concept of a velocity of money. The cash balances equations focus attention on the proportion of their income people choose to keep in the form of money. The advantage of a cash balances equation is that "it brings us at once into relation with volition—an ultimate cause of demand—rather than with something [the velocity of money] that seems at first sight accidental, arbitrary and more or less in the air."⁹ This approach suggests that a change in the

⁹ A. C. Pigou, *Essays in Applied Economics*, p. 179.

value of money has an effect upon the net advantages of holding command over real resources in the form of money. For this reason the Cambridge economists have never made the extreme declarations on the relation of the quantity of money to prices that have been made by the adherents of the equation of exchange. The Cambridge economists take the view that the effect of a change in the quantity of money is not simply a proportional change in prices; it is a complex series of reactions touching prices, production, and the desire of the community to hold command over real resources with balances of money. And this effect is not the same for small and isolated changes as it is for large and continued changes in the quantity of money; nor is the effect the same for short as for long periods.

The fundamental objections to the cash balances equations are related to the value of money they measure; and to the assumptions regarding the real resources the community chooses to command, and the money balances the community chooses to hold. The first objection is that the equations do not measure the value of money in purchasing goods and services for final use. This objection is valid if the quantity of money in the equations is taken to be the total quantity of lawful money and deposit money in the community. Robertson's equation suggests a manner in which this objection can be overcome. Instead of using the total quantity of money—lawful and deposit money—only that part of the lawful money held by consumers, and the deposit money held for purchasing real income, should be used in the cash balances equation. If the quantity of money is defined in this manner, the equation is formally valid for explaining the value of money in purchasing goods and services for final use. The quantity of lawful money held to conduct business transactions and the volume of business

deposits can similarly be used to determine the transaction value of money. It must be noted that there is a flow of money from income balances to transaction balances thru expenditure on real income, and from transaction balances to income balances thru payments to the factors of production.

It may be said that there is no way of determining what part of the total quantity of money is held for the purpose of purchasing real income. In fact, the magnitude of few of the factors in the cash balances equations are determinable directly. The value of money in purchasing real income is itself difficult to determine, as has already been said in the discussion on index numbers. The quantity of real resources the community wishes to command with its holdings of money can be found only by reference to the quantity of money and its value. The factor that could be measured most easily, it was assumed, is the quantity of money. Altho it is difficult to separate the cash balances the community holds for the purchase of income from the cash balances for transacting business, it is not impossible. As business tends to be carried on to a greater extent by corporate organizations, it may be assumed that deposits in the names of corporations are held for transacting business, while deposits in the names of individuals are held for purchasing income. With allowances for business enterprises of individual proprietors, and for balances held jointly for income and business, it should be possible to determine the quantity of money intended for use in purchasing goods and services for consumption.

A second objection made by Keynes is that the equations, as generally given, place undue emphasis upon the national income in determining the quantity of real resources the

community chooses to command with its holdings of money. The objection is valid if it is intended to show that the price level, being a transaction price level, is related to the volume of commercial and financial transactions as well as to the real income of the community. However, commercial and financial transactions are largely related to the national income, for they are the means of securing the production and the distribution of the national income, and they are in part determined by the national income. There are other factors influencing the quantity of real resources the community commands with its holdings of money—its monetary habits, the organization of industry and the monetary system, and prospective changes in the value of money. The objection can be obviated by assuming that at any given time there is a quantity of real resources that the community chooses to command with its holdings of money, and that this quantity is determined not by the community's income but by the net advantages of holding command over real resources in this form. Any factor affecting the net advantages of holding money affects the real balances of the community, and the value of money.

Hawtrey has another objection to the cash balances equations. He argues that people do not "settle their cash holdings with *direct* reference to their purchasing power in terms of wealth." Instead, "every one settles what margin of unspent purchasing power he shall keep by reference to his prospective receipts and payments in monetary units." The price level is not itself a part of the calculation.¹⁰ Altho the cash holdings of consumers and business men depend upon prospective receipts and expenditures, these receipts and expenditures are determined by the price level and the real income of the

¹⁰ R. G. Hawtrey, *Currency and Credit*, p. 40.

community. The most advantageous balances are therefore determined fundamentally, if not directly, by the real income of the community and the proportion of that income that it is desirable to be able to buy with money.

It may seem to be reasoning in a circle to say that the real value of the total quantity of money in the community determines the price level, for it is the price level that determines the value of the community's holdings of money. However, there is one partially independent factor—the quantity of real resources the community wishes to be able to purchase with its money. The value of money tends to be such, that considering all circumstances present and prospective, the community wishes neither to increase nor to decrease the real value of its cash balances. This equilibrium can be upset only by a change in the quantity of money, or in the community's desire to hold real resources in the form of money.

The most fundamental objection to the cash balances equations is that they do not adequately portray the complexity of the forces that tend to cause a disturbance in the price level. It is not that these forces are not implicitly understood by those using the cash balances equations; but that the equations themselves do not explicitly recognize the importance of these forces. Nor do the equations show the mechanics by which a change in the community's preference for holding command over real resources in the form of money affects the price level. Obviously, it is by increasing expenditure that the community endeavors to diminish its real balances; and by decreasing expenditure that it endeavors to augment its real balances. Keynes has shown that with the assumptions of the cash balances equations, the mechanics of a change in the price level can be interpolated without

difficulty.¹¹ The objection, therefore, is not that the cash balances equations are incorrect, but that they are incomplete. Properly interpreted, the cash balances theory is exceedingly useful in explaining some of the forces affecting the price level. It is worthy of note that the cash balances equations were developed at a time when large and rapid changes in the quantity of money were affecting the desire of communities to hold command over real resources in the form of money.

¹¹ J. M. Keynes, *A Treatise on Money*, I, 224-229.

Chapter XI

Income and Expenditure, and the Price Level

1. *Money Income and Real Income*

BECAUSE the price level is the average of the prices of individual commodities, the forces affecting the price level must act thru the prices of individual commodities. The prices of goods at any given time are determined by the equilibrium of the supply of and demand for these goods. The demand for goods depends upon the wants and the income of consumers. The supply of goods depends upon the output of producers and their expectations as to later prices. Under ordinary conditions, the wants of the community being given, the demand for goods is determined by the money income of consumers; and the prospect of price changes being limited, the supply of goods is determined by the output of producers. The general level of prices is therefore related to the money income of the community and to its annual output; and the normal value of money is determined by a balancing of these forces: the money income and the real income of the community. The money income of the community is the sum of all the wages, interest, rents and profits received by the factors of production. The real income is the total of all the goods and services, including investment goods, produced by the factors of production in return for the money income.

The underlying principle of this theory of the value of money has been presented in a simple and concise form by

the French economist, Albert Aftalion. He states that a change in the general level of prices can result only from a relative change in the money income and the real income of the community. The real income remaining constant, the price level varies directly and proportionally with changes in the money income; and the money income remaining constant, the price level varies inversely and proportionally with changes in the real income of the community. These assumptions can be stated in the form of an equation:

$$P = \frac{I}{R}, \text{ where}$$

P is the average price of a unit of goods and services in a community in a given period of time;

I is the money income of the community; and

R is the real income of the community in units of goods and services in the same period of time.¹

This is the primary form of all equations that explain the value of money by income and expenditure.

The usefulness of this equation depends upon the validity of its assumptions. Obviously, it is not necessarily true that the money income of a given year is spent in the period in which it is earned. Some of it is withheld for expenditure in later years; and some of it is used to pay for purchases of earlier years. Unless there is difficulty in borrowing and in saving, part of the money income of any year will be used in payment for real income of other years. Similarly, the entire real income of any year is not sold in the period in which it is produced, for part of the output is added to dealers' inventories, and part of the output of other years is withdrawn from inventories to be sold this year. It is there-

¹ F. B. Garver and A. H. Hanson, *Principles of Economics*, pp. 365-367.

fore unlikely that the real income and the money income will be equated in any given year; altho there is tendency over a long period of time for the money income to be spent on the real income of that period. It must also be noted that because production is spread over time, the expenditure of a given period is largely on the output of earlier periods; and much of the current output will be sold in later periods. The objection to Aftalion's equation is that it embodies assumptions that are not likely to be realized. Otherwise, the equation is useful in emphasizing some of the forces affecting the value of money.

P. W. Martin's analysis of factors affecting the price level bears some resemblance to that of Aftalion, altho allowance is made for the fact that the total remuneration of the community, the money income, is not expended for the total output of the community, the real income. If the total remuneration of the community were used to purchase the entire output of the community, the resulting price level would be just remunerative—that is, sufficient to compensate business men for their expenses of production including normal profits. A change in the expense of producing a unit of output gives rise to a similar change in the remunerative price. While there is a tendency for the actual price level to correspond to the remunerative price level, the two are seldom precisely equal, for there are always some forces tending to disturb the actual price level—to raise it above or to reduce it below the remunerative price level.

The forces tending to bring about a movement of the actual price level away from the remunerative price level are those that lead to a superabundance or deficiency of purchasing power. The most obvious of these forces is a change in the total quantity of money in circulation. An

influx of new money—newly mined or imported gold, increased issues of lawful money, increased bank loans, or dis-
hoarding by the community—unless offset by other forces must lead to a superabundance of purchasing power and a rise in prices above the remunerative level. Conversely, a decrease in the total quantity of money in circulation, not offset by other forces, must lead to a deficiency of purchasing power and a fall in prices below the remunerative level. Similarly, an increase in working capital—to hold larger cash balances, to hold larger inventories, to extend credit or to buy securities—if secured by business firms from consumers or taken from profits, must lead to a deficiency of purchasing power, and unless offset by other forces, to a fall in prices below the remunerative level. Conversely, a decrease in working capital, if not used to repay bank loans, and not offset by other factors, must lead to a superabundance of purchasing power and to a rise in prices above the remunerative level. The third important force affecting purchasing power and the price level is the money volume of commodity stocks voluntarily held by business firms. An increase in the money volume of commodity stocks must lead to a superabundance of purchasing power and a rise in prices above the remunerative level, unless offset by other forces. Conversely, a decrease in the money volume of commodity stocks, under similar circumstances must lead to a deficiency of purchasing power and a fall in prices below the remunerative level.

Changes in these important factors affecting the sufficiency of purchasing power are always taking place. Whether the actual price level is to rise above or fall below the remunerative price level must depend upon which set of forces is predominant—those leading to superabundance

of purchasing power or those leading to deficiency of purchasing power. The prevailing price level is thus determined by two factors: the remunerative price per unit of output, and the superabundance or deficiency of purchasing power per unit of output sold. The price level may change because of a change in the remunerative price—a change not affecting employment—or because of a change in the sufficiency of purchasing power—a change having repercussionary effects upon employment, and therefore of particular importance to the community.²

2. *Consumers' Income and Consumers' Outlay*

Altho the approach of R. G. Hawtrey to the problem of the value of money resembles in some ways that of the Cambridge economists—for instance, in his use of the concept of an unspent margin of purchasing power—his views are essentially similar to those that hold that the principal forces affecting the value of money are income and expenditure—for instance, in his emphasis on consumers' income and consumers' outlay. The cause of changes in the value of money, according to Hawtrey, is the variation in consumers' income, consumers' outlay and their cash balances, and in producers' output, their stocks of goods and their cash balances. These forces affect each other, and together they determine the value of money.

An unspent margin of money is necessary for the reasons given by the Cambridge economists. Individuals hold a reserve of money because income and expenditure do not proceed at the same rate; because everyone holds a supply of money to meet unforeseen emergencies; and because savings must be accumulated before they can be invested. For busi-

² P. W. Martin, *Maintaining Purchasing Power*, Pt. II, chaps. IV-IX.

ness men the problem of maintaining a cash balance is fundamentally the same. They may depend upon loans to enable them to meet unforeseen emergencies, and generally they have no need to accumulate savings awaiting investment; but they need a cash balance to provide for the irregularity in the rate at which their purchases and sales are made. "For each individual, the appropriate . . . balance of cash will bear a determinate proportion to his income. . . For each business the appropriate balances will likewise be determined by convenience, but will be proportional rather to the gross transactions or turnover than to the net income of the business. In all cases alike the balances of purchasing power kept in reserve are settled with a view to the transactions to be financed." ³ That is, the cash balances are determined by the consumers' prospective income and outlay, and by the traders' prospective turnover. Obviously, the traders' balances will bear a smaller proportion to their turnover than consumers' balances to their income and outlay.

The reserve of purchasing power is called the unspent margin, divided into consumers' balances held for expenditure on consumption and investment, and traders' balances held to finance production and trade. The unspent margin is equal to the supply of lawful money in the hands of the public and the deposit liabilities of the banks. An addition of cash to banks, withdrawn from circulation, which is credited to deposits, or a withdrawal of cash from banks, added to circulation, which is debited to deposits, leaves the total of the unspent margin unchanged. Variations in the unspent margin can occur only by action of the issuing authority in increasing or decreasing the issue of lawful money, and by the action of the banks in creating more or

³ R. G. Hawtrey, *Currency and Credit*, pp. 42-43.

less bank credit. Banks are always creating bank credit and business men are always repaying loans, altho the processes of making loans and repaying loans do not go on at the same rate. The principal cause of a variation in the unspent margin is a change in the net amount of bank loans outstanding.

When the rate at which credit is extended by banks exceeds the rate at which loans are repaid by business men, the immediate effect is an increase in traders' balances. Since loans are made to finance production, the increased traders' balances are paid out to the factors of production and increase consumers' income. Generally, the immediate effect of an increase in consumers' income is an increase in consumers' balances; but most of the increased balance is soon spent on the consumers' outlay, including investments. As the money is expended on goods and investments, it comes once more into the hands of dealers. Part of the increased traders' balances is needed to finance the larger turnover; but much of the increase is unnecessary, and rather than accumulate idle balances, traders repay their loans from banks.

The creation of credit, by affecting consumers' outlay, also affects production and prices. The increase in the consumers' outlay depletes the stocks of goods and securities in the hands of dealers. But dealers are not prepared to permit their stocks to be decreased too much. They therefore raise prices and place orders for production. If industry is employed to capacity, production cannot be increased and the expansion of bank credit is reflected almost entirely in a rise of prices. If the factors of production are not fully employed, the effect is to increase production rather than prices. The series of effects of an increase in consumers' outlay is as follows: an increased sale of goods and investments

from dealers' stocks, an increase in the production of goods and in the issue of new securities, a rise in prices. These stages overlap, altho in part they go on simultaneously. Of course, if the expansion of bank credit has no influence on consumers' outlay—altho this is inconceivable—there can be no effect on prices and production.

Similarly, when the rate at which business men repay bank loans exceeds the rate at which banks extend loans, the immediate effect is a decrease in traders' balances, and in their payments to the factors of production. The consumers' outlay falls with the decrease in consumers' income, altho for a time the unspent margin is drawn upon to maintain customary expenditure and the decrease in the consumers' outlay is less than the fall in consumers' income. As consumers' outlay decreases, the stocks of goods in the hands of dealers rise above normal, and rather than hold unnecessarily large inventories they reduce prices and diminish their orders for production. A restriction in bank credit thus inevitably decreases the consumers' outlay and with it prices and production.

The price level in any period is determined largely by the consumers' outlay for consumption goods. The consumers' outlay is dependent upon the consumers' income and variations in their unspent margin. Consumers' income is determined by the creation and repayment of credit, and by variations in traders' balances. Consumption depends upon the volume of production and upon variations in dealers' inventories. "With a given volume of consumption (including investment) the price level is proportional to the consumers' outlay. When it fails to vary in exact proportion, that means that the volume of consumption changes, either because stocks of goods are added to or drawn

upon, or because production is increased or decreased.”⁴ All the forces bearing upon the consumers’ outlay and the volume of consumption determine the price level.

This analysis may be expressed in the form of equations. Suppose a condition of equilibrium in which consumers’ income equals consumers’ outlay, and production equals consumption. The relation of these factors to prices is shown by the equation

$$P = \frac{B}{X} \quad \begin{array}{l} \text{(the primary income expenditure equation)} \\ \text{where} \end{array}$$

P is the average level of prices during a period of time;

B is the consumers’ income and outlay; and

X is the volume of goods and services produced and consumed in the same period of time.

The equation can be modified to allow for conditions of disequilibrium. Assume that an increase or decrease in the rate at which credit is created relative to the rate at which credit is repaid has upset equilibrium, so that consumers’ outlay is no longer equal to consumers’ income, and consumption is no longer equal to production. The differences in income and outlay, and in production and consumption, are accounted for by changes in consumers’ balances, and in dealers’ stocks of goods. This is shown by the equation

$$P = \frac{M + B - M'}{S + X - S'}, \quad \text{where}$$

P is the average level of prices during a period of time;

M is the consumers’ balances at the beginning of the period;

B is the consumers’ income during the period;

M' is the consumers’ balances at the end of the period;

⁴ R. G. Hawtrey, *Currency and Credit*, p. 51.

S is the stocks of goods and investments in the hands of dealers at the beginning of the period;

X is the volume of production during the period; and

S' is the stocks of goods and investments in the hands of dealers at the end of the period.

The consumers' outlay is equal to $M + B - M'$, so that when there is no change in consumers' balances — $M = M'$ — consumers' outlay is identical with consumers' income. Similarly, consumption, including investment, is equal to $S + X - S'$, so that when there is no change in dealers' stocks — $S = S'$ — consumption is identical with production. Equilibrium—consumers' income equals consumers' outlay, and production equals consumption—is seldom long maintained, because credit is essentially unstable.⁵

In general, the relative rate of creation and repayment of bank credit depends upon the opportunity for business profits. A prospect of higher prices and a lower bank rate of discount increase the demand for credit; and conversely, a prospect of lower prices and a higher bank rate of discount decrease the demand for bank credit. The supply of credit is determined by the banking system with reference to its reserves of lawful money, including reserve deposits with the central bank. A higher discount rate induces banks to increase the supply of credit by reducing the ratio of reserves to deposits and by replenishing reserves by borrowing from the central bank. A lower discount rate induces banks to decrease the supply of credit by increasing the ratio of reserves to deposits and by repaying borrowed reserves to the central bank. Ultimately, the rate of creation of credit is controlled by the central bank, for it determines in various ways the supply of bank reserves.

⁵ Cf. Hawtrey's algebraic analysis, *Currency and Credit*, pp. 60-63.

According to Hawtrey, there is not always a direct relation between money and prices. The effect of a given quantity of money on consumers' income and outlay and on production and consumption varies with business conditions. There is a normal tendency for the price level to vary with the unspent margin. This relationship is frequently disturbed by a change in the advantages of holding money. "With due caution and with proper qualifications, it is legitimate to infer a rise or fall in prices from an increase or decrease in the quantity of the means of payment, and in general the price movement is actually more than in proportion to the change in the quantity of the means of payment."⁶ Under any circumstances, it is only thru consumers' outlay that changes in the quantity of money can affect prices.

3. *Saving and Investment*

The theory of the value of money developed by Keynes in his *Treatise on Money* resembles that of Hawtrey, altho emphasis is placed on another aspect of expenditure, investment. In this Keynes departs almost completely from his earlier explanation of the value of money by the desire to keep command over real resources in the form of money. In his new treatment, he seeks "not merely to establish identities or statical equations relating (e.g.) the turnover of money instruments to the turnover of things traded for money, . . . [but] to treat the problem dynamically, analysing the different elements involved, in such a manner as to exhibit the causal process by which the price level is determined, and the method of transition from one position of equilibrium to another."⁷

The money income of the community according to

⁶ R. G. Hawtrey, *Currency and Credit*, p. 58.

⁷ J. M. Keynes, *A Treatise on Money*, I, 133.

Keynes, is precisely the same as the expenses of production of business men, for all expenses of production consist, fundamentally, of wages, interest, rents and monopoly gains, and business earnings. The business earnings are not the entire net income of business men, but that part of their net income which would be just sufficient to induce them not to alter the volume of employment they offer to the factors of production.⁸ Anything in excess of business earnings is profits; and profits are negative when the net income of business men falls short of their business earnings. The money income of the community is distributed among the factors of production for their efforts in producing consumption goods and investment goods; and these earnings are used in purchasing consumption goods and in saving (which may be defined as non-consumption).⁹ When the

⁸ The following related terms are used in this and later chapters. The net income of business men is the amount by which their sales proceeds, including claims receivable, exceeds their expenses of production. Business earnings are the amount of net income just sufficient to maintain the prevailing volume of employment of the factors of production. Normal business earnings are the amount of net income just sufficient to maintain the full but not excessive employment of the factors of production. Business profits are the amount by which the net income of business men exceeds business earnings. Inflationary or deflationary profits are the amount by which the net income exceeds or falls short of normal business earnings. For a criticism of Keynes's definition of business earnings, see S. H. Slichter, *Towards Stability*, p. 47 n. He suggests that business earnings should be defined as that rate of remuneration which would induce business men to expand operations sufficiently to absorb the current volume of savings.

⁹ The money income not used in purchasing goods for consumption (savings) may or may not be used in purchasing goods for investment. Similarly, the amount of money used to acquire new investment goods may be equal to, exceed or fall short of the volume of savings. This distinction is found in writers before Keynes. For example, Professor Taussig writes: "When all incomes and expenditures take the form of money, savings are made not by putting aside things in kind for one's own use but by putting aside money for future needs. On the other hand, tools and other appa-

expenditure on consumption goods is equal to the earnings of the community in the production of these goods, the price level for consumption goods is normal—that is, it is equal to the expenses of production including the earnings of business men. Similarly, when the market value of investment goods is equal to their expenses of production, the price level of investment goods is normal.

These assumptions can be put in the form of equations for the price level of the output of all goods, and for the price levels of goods purchased for consumption and for the new goods added to investment.

O , the total number of units of output in a period of time consists of

R , the number of units of goods purchased for consumption in this period of time, and

C , the net number of units of goods added to investment—that is, not purchased for final use.

The units of goods are defined so that a unit of each, regardless of the kind, has the same cost of production at the base date.

E , the total earnings of the community in the given period of time, is also the total cost of producing the output; and

S , the savings of the community in the same period of time, is that part of the earnings not used to purchase goods for current consumption.

ratus of production are made for the market by persons who are not consciously providing for the future. They are then bought by other persons who wish to 'invest.' The process by which these separate steps are made to bring about their joint result in the modern organization of industry deserves careful consideration." *Principles of Economics*, I, 73.

The price level of the goods purchased for consumption is shown by the equation

$$P = \frac{E - S}{R}, \text{ where}$$

P is the price of a unit of goods purchased for consumption, and the other symbols are as defined above.

The price level of new investment goods is shown by the equation

$$P' = \frac{I}{C}, \text{ where}$$

P' is the price of a unit of goods purchased for investment, I is the total market value of new investment goods, and C is as defined above.

The price level of the output of all goods is shown by the equation

$$\pi = \frac{E - S + I}{O}, \text{ where}$$

π is the price of a unit of output, and the other symbols are as defined above.

These equations state that the price of a unit of these types of goods is determined by the expenditure on each type of goods and the quantity purchased.

The equations can be stated in a form relating the price levels for the different types of goods to the expenses of production and to the volume of saving and investment. The units of quantities of the different types of goods are defined as having the same cost of production. Since the earnings of the community, E , are also the expenses of producing the output, O , the cost of producing a unit of output is $\frac{E}{O}$.

If the expenses of producing new investment goods are represented by the symbol I' , the cost of producing a unit of such goods is $\frac{I'}{C}$. The expenses of producing goods purchased for consumption are equal to $E - I'$, and the cost of producing a unit of such goods is $\frac{E - I'}{R}$. As the cost of producing a unit of the different types of goods is the same,

$$\frac{E}{O} = \frac{I'}{C} = \frac{E - I'}{R}.$$

The price of a unit of goods is its cost of production plus or minus the profit or loss per unit. The profit from the sale of goods purchased for consumption, receipts ($E - S$) less expenses ($E - I'$), is $I' - S$; and the profit per unit is $\frac{I' - S}{R}$. The price for a unit of goods purchased for consumption—cost plus profit—is shown by the equation

$$P = \frac{E}{O} + \frac{I' - S}{R}.$$

Similarly, the price of a unit of output is its cost of production plus or minus the profit or loss per unit; and it is shown by the equation

$$\pi = \frac{E}{O} + \frac{I - S}{O}.^{10}$$

The price of a unit of goods purchased for consumption is determined by three factors: the cost of production, the amount spent by business men in producing goods purchased for investment, and the amount of savings. A change in

¹⁰ J. M. Keynes, *A Treatise on Money*, I, 135-140.

price may be due to a change in any of these factors. The changes most important to business men are those involving the cost of new investment and the amount of savings, for these factors affect business profits. The price of a unit of output is also determined by three factors: the cost of production, the amount spent in the purchase of new investment, and the amount of savings. Similarly, a change in price may be due to any of these factors; and the changes most important to business men are those involving the value of new investment and the amount of savings. Variations in the output of goods are due to changes in profits; and the community is vitally interested in maintaining a proper relationship between savings and the value and the cost of new investment.

A condition of equilibrium—in which the income of business men is equal to normal business earnings, and there are no profits and losses—requires the equality of saving and investment. The proportion of earnings that a community saves depends on the real rate of interest—that is, the nominal rate of interest and the rate of change in the value of money. The volume of investment depends on the prospect of profits from undertaking new production and on the rate of interest that must be paid for funds to finance new production. A decline in the rate of interest increases investment relative to saving. The banking system, which by its loans provides means for investment, is an important factor in determining the volume of investment, for the attractiveness of investment depends in large part upon the rate of interest charged for bank loans. The control of the volume of investment by the banking system is direct; and the community is justified in looking to the banking system to maintain equilibrium in saving and investment.

A change in the price level may also be due to a change in the efficiency of the factors of production, but unless this affects saving or investment, it cannot bring about disequilibrium. If the remuneration of the factors of production is flexible and varies with efficiency, a change in efficiency does not affect the price level. Increased efficiency is then accompanied by increased earnings and by a corresponding increase in output, so that, no other cause of disequilibrium appearing, the price level remains constant. The situation is somewhat different if there is rigidity in the remuneration of the factors of production, and a change in efficiency is not accompanied by a corresponding change in earnings. While earnings remain constant, there is an increase or decrease in output, and the price level of output tends to vary inversely with the change in efficiency. There may be a temporary disequilibrium—profits or losses to business men—if the price level lags behind changes in the cost of production. The disequilibrium differs from that caused by a change in investment relative to saving. The latter is a cumulative type that continues until the cause is removed; the former is a non-cumulative type that continues only during the lag in the price level, so that disequilibrium is a temporary stage in passing from one position of equilibrium to another.

According to Keynes, the disequilibrium caused by a change in investment relative to saving cannot be overcome solely by changes in the remuneration of the factors of production. The earnings of the factors of production can be changed by varying the volume of employment and the rates of remuneration. Unless these changes affect the relation of saving to investment, they will not of themselves alter existing profits or losses. No matter how much earnings rise, so

long as the increased earnings are spent on consumption and investment, total profits will not fall. Similarly, if earnings fall because of a decrease in output or in the rates of remuneration, losses will continue if the excess of saving over investment persists. Of course, if a business man can reduce his expenses relative to the expenses of other business men, his profits will rise or his losses diminish. But business men as a group will find their profits or losses unaffected by a change in the rates of remuneration, unless these changes affect the relation of saving to investment.

The relationship of the price level to the quantity of money, according to Keynes, is not of the direct character assumed in other quantity theories of money. It is only when economic activity is in equilibrium—when the factors of production are fully employed, and when the savings of the community are equal to the cost and the value of new investment—that the direct relationship of the quantity of money to prices becomes operative. Under these circumstances, a variation in the quantity of money, not affecting employment or the relation of saving to investment, must affect prices proportionally. But “in the actual world a change in anything is likely to be accompanied by some change in everything else.” The changes that take place in the quantity of money, in earnings and in output, will not be related in a predictable degree to changes in prices. More particularly is this true during the extreme phases of a business cycle.

4. Statistical Evidence

According to Hawtrey, given the quantity of goods and investments purchased, the price level is determined by the consumers' outlay. Variations in consumers' outlay are due

to changes in the rate at which bank credit is created and repaid; and for this reason ought to be indicated by variations in loans made by banks. The tendency of the price level and bank loans to vary together is shown in the following table.

Bank Loans and Wholesale Prices, 1923 to 1925

	1923		1924		1925	
Month	Loans*	Prices**	Loans*	Prices**	Loans*	Prices**
January	7,396	102.0	7,769	99.6	8,134	102.9
February	7,517	103.3	7,827	99.7	8,170	104.0
March	7,717	104.5	8,005	98.5	8,232	104.2
April	7,762	103.9	7,965	97.3	8,171	101.9
May	7,746	101.9	7,928	95.9	8,094	101.6
June	7,796	100.3	7,902	94.9	8,102	103.0
July	7,775	98.4	7,911	95.6	8,086	104.3
August	7,812	97.8	7,936	97.0	8,253	103.9
September	7,955	99.7	8,188	97.1	8,438	103.4
October	7,959	99.4	8,256	98.2	8,489	103.6
November	7,891	98.4	8,189	99.1	8,461	104.5
December	7,742	98.1	8,164	101.5	8,320	103.4

* Loans, in millions of dollars, other than on securities, Federal Reserve reporting member banks, *Survey of Current Business*, 1932, Annual Supplement, p. 76.

** Bureau of Labor Statistics, index number of wholesale prices, 1926 = 100.

It should be noted, however, that with the tendency of business organizations to hold large cash balances, a considerable expansion in the volume of production and employment, and some increase in the price level, is possible without the extension of additional bank loans.

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Loans and Investments of National Banks and Business Conditions*

Date.		State of Business.	Bank Credit.
June,	1876	— Above normal	\$1,000 million
December,	1878	— Deep depression	906 "
October,	1879	— Normal	972 "
April,	1884	— Normal	1,422 "
May,	1885	— Deep depression	1,331 "
June,	1886	— Normal	1,495 "
May,	1893	— Above normal	2,316 "
February,	1894	— Deep depression	2,063 "
June,	1895	— Normal	2,225 "
August,	1907	— Above normal	5,386 "
May,	1908	— Deep depression	5,268 "
September,	1909	— Normal	6,050 "
September,	1920	— Above normal	**17,057 "
September,	1921	— Deep depression	**14,901 "
September,	1922	— Recovery	**15,445 "
September,	1929	— Above normal	**22,646 "
April,	1933	— Deep depression	**16,288 "
June,	1934	— Slight recovery	**17,737 "

* Adapted from W. M. Persons, *Forecasting Business Cycles*, pp. 60-61.

** All reporting member banks of the Federal Reserve system.

It is invariably true that the volume of available bank credit is diminished during periods of business depression, and increased during periods of recovery and prosperity.

The relative rate of creation and repayment of bank credit depends upon the opportunity for business profits, and upon the discount rate of banks. According to Hawtrey the de-

mand for bank loans for the purpose of holding stocks of goods is particularly sensitive to changes in the discount rate. The available statistical data indicate that Hawtrey is probably right. The stocks of goods that dealers need on hand depend on the volume of production and consumption. There is evidence that at a time of rising discount rates, stocks of manufactured goods fall relative to needs, and conversely, at a time of falling discount rates, stocks of manufactured goods rise relative to needs. This can be seen from the following table.

Stocks of Manufactured Goods and Interest Rates, 1922 to 1931

Year	Industrial Production (1)	Stocks of Manufactures (2)	Relative Stocks (2/1)	Interest* Rates
1922.....	86	87	101	4.48 p.c.
1923	101	94	93	5.01
1924	94	103	110	3.88
1925	105	103	98	4.03
1926	108	107	99	4.33
1927	106	114	108	4.11
1928	112	118	105	4.85
1929	119	120	101	5.84
1930	95	123	129	3.58
1931	80	114	142	2.59

(1) 1923-1925 = 100. *Survey of Current Business*, Annual Supplement, 1932, p. 8.

(2) 1923-1925 = 100. *Survey of Current Business*, Annual Supplement, 1932, p. 18.

* Annual average rate on prime commercial paper, 4 to 6 months, *Survey of Current Business*, Annual Supplement, 1932, p. 76.

The general tendency of relative stocks of manufactured goods to vary inversely with discount rate is apparent. It must not be overlooked that to some extent the larger rela-

tive inventories of 1924, 1927, 1930 and 1931 are a reflection of the difficulty of selling goods at a remunerative price in those years.

The price level of output, according to Keynes, is determined by three factors: the cost of production, the amount of savings and the volume of investment. The available data are entirely inadequate for the purpose of determining what part of the changes in the price level in recent years may be attributed to each of the basic factors. Some rough estimates of the magnitudes of these factors are available and are useful in illustrating the manner in which these factors affect economic conditions. The efficiency of the factors of production tends to increase at the rate of 1 to 3 per cent, annually; and in general, money earnings in this country tend to rise with increased efficiency, altho there is commonly a lag. The annual savings in the United States tend to be from 10 to 16 per cent of the national income, the proportion varying with income, and averaging about 14 per cent. The volume of investment is the most variable factor, ranging from almost nothing to a maximum of about 20 per cent of the national income. The most rapid changes are obviously in the volume of investment.

From 1925 to 1929 the efficiency of the factors of production in this country increased at least 3 per cent annually. The remuneration of the factors of production as evidenced by money wages increased somewhat more than 1 per cent annually. The cost of production fell sharply in this period, and prices of manufactured goods did not fall as rapidly as costs, largely because of the great volume of investment relative to saving. Unfortunately, there are no satisfactory statistics on the saving done by the American people. The volume of investment is shown approximately by the volume

of construction and by the addition to stocks of goods held by business men. From 1925 to 1928, these forms of investment increased; but in 1929 and after, there was a large decrease in the volume of construction, and in 1930 and after in the volume of investment in working capital. It must be noted that a decrease in working capital is the equivalent of negative investment. The following table shows the change in the volume of some of the more important forms of investment from 1925 to 1933.

Wholesale Prices and Investment, 1925 to 1933

Year	Price Index (1)	Index of Const'n (2)	Index, Stocks of Manufactured Goods (3)
1925.....	103.5	122	103
1926.....	100.0	129	107
1927.....	95.4	129	114
1928.....	96.7	135	118
1929.....	95.3	117	120
1930.....	86.4	92	123
1931.....	73.0	63	114
1932.....	64.8	28	104
1933.....	65.9	26	103

(1) 1926 = 100. Bureau of Labor Statistics, index number of wholesale prices.

(2) 1923-1925 = 100. *Survey of Current Business*.

(3) 1923-1925 = 100. *Survey of Current Business*.

5. *Objections to the Views of Hawtrey and Keynes*

The theories of Hawtrey and Keynes on the value of money are quite similar, despite the different emphasis on causes of price changes. According to Hawtrey, the principal cause of a change in prices is a change in the rate at

which bank loans are created and repaid. According to Keynes, the principal cause of a change in prices is a change in the relation of saving to investment. As savings are less variable than investment, it is not too much to say that Keynes regards a change in investment as the dominant cause of a change in the price level in short periods. The purpose for which loans are made by the banking system is largely investment, particularly in working capital; and it is difficult to conceive of investment exceeding savings unless the banking system is making loans more rapidly than they are repaid. And a large excess of saving over investment is generally caused by the repayment of loans to banks in greater volume than new loans are made. There is little difference, in fact, in the concepts "the creation of credit" and "the volume of investment." A difference would appear if the banking system were to extend a large quantity of consumers' credit. In Hawtrey's view this would affect prices like any other extension of credit—that is, by increasing the consumers' outlay in a given period. In Keynes's theory consumers' credit, for example, in the form of instalment sales, could be regarded as negative savings; and if it were not offset by a decrease in investment, there would be a tendency for prices to rise. When the creation of credit increases relative to its repayment, it seems inevitable that investment is also increasing relative to saving.

There is little of fundamental importance in Mr. Hawtrey's analysis that can be disputed. Given the volume of output offered for sale, changes in the price level must be due to changes in consumers' outlay, including expenditure on investment. Unless consumers' balances are increased or decreased, changes in consumers' outlay must be due to changes in consumers' income. The income paid to con-

sumers for their contribution to production is withdrawn from traders' balances; and the balances of money held by traders are dependent in part on creations and repayments of bank credit. The independent factor affecting consumers' income and outlay and the price level, according to Hawtrey, is the rate of creation and repayment of bank credit. Altho this analysis of the factors affecting the price level is substantially sound, there are other factors of great importance that are given insufficient consideration by Hawtrey. Particularly, he neglects the effect of consumers' outlay on traders' balances, and the effect of changes in the desire of traders to hold balances of money on their employment of and payments to the factors of production—that is, on consumers' income. It is conceivable that business men will hold large cash balances without repaying bank credit and without engaging in production. Many large firms are not borrowers of short term credit, and in periods of unprofitable business their cash balances accumulate instead of being paid out as income to the factors of production, a condition common in this country since the 1920's.

There has been some objection to the terminology employed by Keynes. Much of this objection could be obviated by greater use of the concepts of negative investment and negative saving. Keynes recognizes that the volume of investment may be negative because of the withdrawal of finished goods from dealers' stocks for retail sale, and because of the non-replacement of depreciated capital goods; but he gives no adequate definition of negative investment. There is also some difficulty in properly classifying the repayment of bank loans. Probably this process should be regarded as negative investment. As it is generally accompanied by the withdrawal of investment, it is the counter-

part of the making of bank loans that is accompanied by investment. Some people have found difficulty in classifying the expenditures of government financed by the issue of money. Keynes has indicated that when such expenditures are made for work done, they may be classified as investment, otherwise as negative saving. The difficulties of providing familiar terms for new concepts are far greater than is apparent, and on the whole, Keynes has met these difficulties in a satisfactory manner.

A more serious objection is that the equations are not dynamic, but static. Since production is spread over time, the earnings of a given period are not related to the expenses of production of the goods purchased for consumption in the same period, but to the expenses of production of the goods that will be purchased for consumption in subsequent periods. To make the equations formally valid, it must be assumed that the earnings and expenses remain constant during an interval of time sufficient to include the past and present periods of production; and that the output, the efficiency of the factors of production and their rates of remuneration remain unchanged. As a device for bringing into view the forces that can disturb equilibrium under such static conditions, the equations of Keynes are quite satisfactory. However, they do not give a complete picture of the operation of forces bringing about a disturbance of equilibrium in actual life. As Robertson holds, there is probably less difference fundamentally in these equations and in the older equations of Fisher and Pigou than is generally assumed.

One important question that is inadequately treated by Keynes is how far a change in investment relative to saving is caused by a change in the rates of remuneration of the

factors of production. Increased earnings, if spent on output, return to business men as receipts; but in the process of spending the increased earnings, the distribution of the real income among the factors of production is changed. It is probable that the first effect of increased rates of remuneration is to diminish the expenditure of business men on consumption, and with it their share of the real income of the community. Unless business men increase their payments to themselves as business earnings in the same proportion as the increase in the earnings of the other factors of production—and in the short run they do not—their real income must fall off. An increase in the rates of remuneration of the factors of production thus brings into existence two kinds of savings that tend to disturb the relation of saving to investment: first, with higher money earnings, the factors of production will certainly increase their cash balances to some extent, and they may further increase savings by continuing the same real volume of consumption; second, the deficiency in the consumption of business men is equivalent to the saving by business men of the money value of the deficiency in their consumption.

Of Keynes's three equations—for the price level of output, for the price level of goods purchased for consumption, and for the price level of goods purchased for investment—the third is open to great objection. The collection of goods for which the price level of investment is taken is not homogeneous in character. Not only does it include capital goods, and the raw materials that constitute working capital; but it also includes goods ready for consumption that are added to dealers' stocks. Such goods are investment goods only by definition, for their normal use is quite different from the use of capital goods in further production. And

since the total investment may be negative, logically there ought not to be a price level of investment goods under such conditions, altho capital goods would still be made and sold.

It may finally be said of the equations of Keynes that they are more useful in accounting for changes in the price level than in explaining the prevailing level of prices. The equations show that prices are equal to the cost of production plus or minus the profit or loss that results from the relation of investment to saving. But the equations do not indicate what determines the cost of production. Proximately, it is determined by the efficiency of the factors of production and their rates of remuneration; but the rates of remuneration are in part determined by the price level. The equations of Keynes indicate what forces bring about a departure of prices from costs. In fact, it is implicitly assumed in the equations that the unit costs of production do not change in the interval for which the price level is being determined. This criticism does not diminish the usefulness of Keynes's theory, for the practical problem is not so much what determines a particular level of prices, as it is what brings about a change in the price level.

Chapter XII

The Discount Rate and the Price Level

1. *Interest Rates and Discount Rates: Real and Nominal*

THE income and expenditure theories of the value of money relate fluctuations in the price level to corresponding changes in the income and expenditure of the community. According to Hawtrey, consumers' income and outlay depend upon the rate at which credit is created and repaid; and this in turn depends upon the opportunity for profitable use of bank credit, in which the discount rate is an important factor. According to Keynes, the price level is largely determined by the volume of saving and investment. The amount of saving in a community with a given income depends upon the real rate of interest; and the volume of investment depends upon the possibility of using capital profitably at prevailing interest and discount rates. In these various ways, the income and expenditure of the community are related to the prevailing rates of interest and discount and to the yield on investment.¹

The interest rate that prevails in a community is determined by the equilibrium of the supply of and demand for savings for long period loan. The quantity of savings that

¹ Cf. what the late Professor Young said: "Whether short-time borrowing is more profitable at one time than another depends on the differential between profits and interest." A. A. Young, *Economic Problems New and Old*, p. 68. See also the statement of Thorstein Veblen: "New investments are made on the basis of current rates of interest and with a view to securing the differential gain promised by the excess of prospective profits over interest rates." *The Theory of Business Enterprise*, p. 218.

lenders are prepared to offer is dependent upon many factors: the income of the community, the distribution of that income among the rich and the poor, the eagerness of people to provide for the future by saving part of their present income, and the interest rate that can be secured for loans. The demand for savings comes from business men who wish to invest in the means of production, from governments, and to some extent from consumers who anticipate their future income. By far the greater part of the demand for savings comes from business men who utilize savings in acquiring capital goods. For this reason it may be said that the interest rate is determined by the supply of and demand for real capital, savings being regarded as a means of securing real capital. The quantity of savings that long period borrowers are prepared to demand is dependent upon many factors: the productivity of labor using fixed capital in production, the probable course of prices and expenses of production, and the interest rate that must be paid on loans.

Apart from this market for long period loans, there is an important market for short period loans. The greater part of this supply of short period loans is provided by banks and other financial houses having money to lend. The demand for short period loans comes largely from business men in need of funds to finance the production and marketing of goods to be offered for sale within a short time, and from speculators in commodities and securities. The quantity of money available for short period loans is almost entirely dependent upon the surplus funds held by banks and other financial houses. The quantity of money demanded for short period loans is particularly dependent upon the profitability of production and the probable course of prices of commodities and securities in the immediate future. The supply

of and demand for long and short period loans are closely related—the short period discount rate being normally determined by the long period interest rate. Nevertheless there is some independence between the long period capital market and the short period money market, because the lenders and borrowers on these markets are not composed entirely of the same groups.

There has always been considerable misunderstanding among business men on the relation between the quantity of money and the interest and the discount rates. It is commonly, altho mistakenly, thought that an increase in the quantity of money must bring about a lower rate on all loans for an extended time after the quantity of money has been increased. Assume that there is an increase in the quantity of money in a country, for example because of a deposit of imported gold. This money will first come into the possession of banks and other financial houses who will find their reserves excessive and will offer short period loans at somewhat lower discount rates. There may be a slight decline in the long period interest rate because the greater fall in the discount rate will induce lenders to divert some funds from the money market to the capital market. As the increased quantity of money comes into the hands of borrowers and is used in financing production or speculation, there will be a tendency for the prices of goods and securities to rise. At the higher prices business men will require larger loans to finance the same transactions, and the discount and the interest rates will tend to rise to their former levels. If, however, the expenses of production do not rise as rapidly as prices, profits will increase, and there will be a demand for additional loans to finance an expansion of production. The result of this will be a moderate rise in the interest rate and a

greater rise in the discount rate. When equilibrium is eventually restored between prices and expenses, the interest rate and discount rate will again be at their normal levels. The series of effects induced by an increase in the quantity of money is as follows: lower discount and interest rates, increased loans, higher prices, greater profitability of business, a rise in the discount and interest rates above their normal levels, an increase in the expenses of production, the restoration of equilibrium, and a fall in the discount and the interest rates to their normal levels.

It must be noted that a rise in the discount and the interest rates does not diminish the demand for loans so long as prices are rising and business becomes more profitable. To understand why the demand for loans should increase in spite of a rise in the discount and the interest rates, it is necessary to distinguish between real and nominal interest and discount rates. With a rise in prices, the nominal interest rate may be increased; but if the percentage rise in prices is more than the increase in the interest rate, the real rate of interest—that is, in terms of goods—becomes lower. The important consideration to business men is not the nominal loan rate, but the real loan rate. So long as prices rise, and this rise in prices is not offset by an equal increase in the discount and the interest rates, business men will expand their demand for loans and their investment in production.

The quantity of funds that business men can borrow for long periods on the capital market is not subject to great variation, depending as it does on the supply of voluntary savings by the community. The quantity of funds that business men can borrow for short periods is more variable, partly because the surplus funds of banks and other financial houses increase and decrease rapidly, and partly because the

loans made by banks are not immediately limited by the voluntary savings of the community. For this reason, the real and nominal discount rates are particularly important as factors affecting the volume of investment and the price level.

2. *Early Development of the Theory*

The importance of the discount rate as a factor affecting prices was first widely recognized during the period of restriction of specie payments by the Bank of England from 1797 to 1821. Many writers on monetary problems regarded the policy of the banking system in extending credit too freely as the primary cause of the rise in prices and the depreciation of sterling exchange. The usury laws limited the discount rate to 5 per cent, and it became apparent that so long as the Bank of England and the country banks were prepared to meet all demands for credit at this rate, the price level could rise very high, and sterling exchange could fall very low. With the artificially low discount rate there was no effective limit to the extension of bank credit and to the rise in prices and the fall in exchange rates.²

This view was rejected by the directors of the Bank of England. They held that "notes issued only in proportion to the demand, in exchange for good and convertible securities payable at specific periods could not tend to any excess in the circulation, or to any depreciation."³ The question of the effect of the restriction on specie payments by the Bank of England was investigated by a Parliamentary Committee, and in their famous report recognition was given to the

² The historical development of this theory is traced by F. A. Hayek, *Prices and Production*, chap. I; *Monetary Theory and the Trade Cycle*, chap. III; and in a note in the *Quarterly Journal of Economics*, XLVII, 123.

³ E. Cannan, *The Paper Pound of 1797 to 1821*, report of the Bullion Committee, p. 39.

close relationship between the discount rate and the price level. The report stated:⁴

It is necessary to observe, that the law, which in this Country limits the rate of interest, and of course the rate at which the Bank can legally discount, exposes the Bank to still more extensive demands for commercial discounts. While the rate of commercial profit is very considerably higher than five per cent as it has lately been in many branches of our Foreign trade, there is in fact no limit to the demands which Merchants of perfectly good capital, and of the most prudent spirit of enterprise, may be tempted to make upon the Bank for accommodation and facilities by discount. Nor can any argument or illustration place in a more striking point of view the extent to which such of the Bank Directors, as were examined before the Committee, seem to have in theory embraced that doctrine . . . that the same complete security to the public against any excess in the issues of the Bank would exist if the rate of discount were reduced from five to four, or even to three per cent.

Among the better known students of economic problems, it was generally acknowledged at the time that when the discount rate at the bank exceeded the prevailing rate of interest, the business community would make little demand for bank credit; and conversely, when the prevailing rate of interest exceeded the discount rate at the bank, there would be a large demand for bank credit. Ricardo stated this view in his *Principles*: "The applications to the bank for money, then, depend on the comparison between the rate of profits that may be made by the employment of it and the rate at which they are willing to lend it. If they charge less than the market rate of interest, there is no amount of money which they might not lend; if they charge

⁴ E. Cannan, *The Paper Pound of 1797 to 1821*, pp. 51-52.

more than that rate none but spendthrifts and prodigals would be found to borrow of them.”⁵

Altho the importance of the discount rate as a factor in determining prices was neglected in the writings of later English economists, it was never entirely lost. Traces of the same view can be found in the writings of Senior, Mill, Sidgwick, Nicholson and Marshall. Among bankers, the relation of the discount rate to prices and exchange rates was at first denied; but in time they altered their views, and by the middle of the nineteenth century the doctrine was generally accepted. The Bank of England, particularly, came to recognize the relation of its bank rate to the exchanges, and variations in the bank rate were commonly made to protect the gold reserve and to maintain parity of the exchanges.

The earlier English writers emphasized the difficulty of limiting the creation of credit in a country when the principal bank of issue was freed from the obligation of redeeming its notes in specie and the discount rate could not be raised. The later English writers, particularly Marshall, gave emphasis to the manner in which the discount rate is ordinarily used to bring about a variation in the quantity of money and in prices. For example, an increase in the amount of gold in a gold standard country does not act upon prices directly. The gold first affects the reserves of bankers and the rate at which they are willing to extend credit. The lower discount rate induces business men to borrow, and they then become purchasers of goods with the borrowed funds. “If there is an extra supply of bullion,” Marshall said, “bankers and others are able to offer easy terms to people in business, including the bill brokers, and consequently there is more money on loan, and consequently people enter into the

⁵ D. Ricardo, *Principles of Political Economy*, chap. XXVII.

market as buyers of things, as starting new businesses, new factories, new railways, and so on.”⁶ A variation in the quantity of gold in a community affected prices by varying the flow of money to business men, who thereupon varied their expenditures. The discount rate was the device by which the flow of money to business men was regulated.

3. *Wicksell's Theory of Prices*

Altho the importance of the rate of interest in determining the value of money was first recognized by English economists, the modern development of the theory is generally associated with the monetary views of two Swedish economists—Knut Wicksell and Gustav Cassel. In his *Geldzins und Güterpreise*, Wicksell restated the relation of the discount rate to prices in the form in which it is now commonly accepted. If banks offer credit at a rate lower than the current yield on capital, those who borrow from banks are able and willing to extend their purchases of goods used in production, and they bid up the price to secure the goods they would not otherwise be able to buy. The rise in prices, by increasing profits, further removes the prevailing discount rate of banks from the current yield on capital, and leads to a continued rise in prices. In this manner the price level rises indefinitely until the discount rate and the current yield on capital are once more in equilibrium. Conversely, a bank rate in excess of the current yield on capital brings about a continued fall in the price level. As Wicksell said:⁷

At every time in every condition of economic circumstances there is one height of the average rate of interest on money at

⁶ A. Marshall, *Official Papers*, p. 49.

⁷ K. Wicksell, *Geldzins und Güterpreise*, p. 111. Cf. his article, “The Influence of the Rate of Interest on Prices,” *Economic Journal*, 1907, p. 213.

which the general level of prices has no tendency to move upward or downward. We call this the normal interest rate. Its amount is determined by the contemporary position of the natural interest rate and must rise or fall with it.

When for any reason the average rate of interest on money is settled at even a small amount below this normal height, and so remains, prices rise and keep rising, or if they are already on the point of falling, they will fall more slowly and finally move in the opposite direction.

Conversely, when the interest rate on money is kept even a small amount above the contemporary position of the natural interest rate, prices fall uninterruptedly and finally below every limit.

The cause of the divergence of the prevailing bank rate of discount from the yield on capital is the use of money in capital transactions. There is, however, an interest rate that corresponds to the rate that would be charged if real capital were lent directly in the form of goods, and that rate Wicksell calls the natural rate.⁸

In general, the views of Wicksell have been accepted and extended by his two most important adherents, Cassel and Hayek, altho each differs in some respects from Wicksell. Cassel recognizes that in modern economic communities the demand for capital takes the form of a demand for loans in terms of money. Part of this demand is met by the savings of the community, but part may also be met by the creation of credit by the banks. It is this creation of credit by the banks that gives rise to a disturbance in the price level. The

⁸ "That rate of loan interest at which the interest rate is kept neutral in relation to the prices of goods, and has the tendency neither to raise nor to lower prices, can be none other than that which would be established by supply and demand if money transactions were not used, and real capital were loaned as goods—that is, what comes to the same thing, the natural rate of interest." K. Wicksell, *Geldzins und Güterpreise*, p. 93.

basis for bank loans ought, therefore, to be the savings of the community. If the banks allow more credit than the community provides by its savings, there is an increase in the amount of active purchasing power in the country without a corresponding increase in the volume of goods. Under such conditions, prices inevitably rise. By a proper regulation of the discount rate, the banks can restrict the demand for loans to the available savings of the community. The proper discount rate is the equilibrium rate of interest. The banks cannot know at any time whether their discount rate is the equilibrium rate of interest; but if the price level in the community rises or falls continually, it is evident that the discount rate is not the equilibrium rate of interest. The practical rule is that the bank rate should be adjusted to maintain a constant level of prices.⁹

In both Wicksell's and in Cassel's discussions the point is definitely made that the natural rate of interest—that is, the rate that equilibrates the supply of savings and the demand for loans—will also keep the price level constant. This is not precisely correct. If there were no changes in the quantity of money other than from the creation and repayment of bank credit, and if production and consumption, income and expenditure remained unchanged, it would probably be true that the natural rate of interest would also maintain a stable price level. But in a society in which changes in the quantity of money, in methods of production, and in other factors, are continually taking place, it does not follow that the rate of interest that brings about an equality in the volume of saving and investment also keeps prices constant. Under such

⁹ G. Cassel, *Money and Foreign Exchange After 1914*, p. 103; *Fundamental Thoughts in Economics*, p. 124; "The Rate of Interest, the Bank Rate, and the Stabilization of Prices," *Quarterly Journal of Economics*, XLII, 517-518.

conditions, all that can be said is that a change in the price level is not brought about by the divergence of the bank rate of discount from the natural rate of interest.

Wicksell's statement that prices can rise or fall indefinitely so long as there is a divergence between the discount rate and the natural rate of interest has been disputed on many occasions. Cassel holds that the tendency for prices to rise or fall with a divergence of interest rates is not cumulative. He argues that the forced saving and creation of capital goods drives down the yield on capital, so that after a time the low bank rate of interest does not act as a stimulant to higher prices. There is in Cassel's argument no grounds for holding that the rise in prices is not cumulative so long as the bank rate of discount is retained at its lower level. In the first place, the real yield of capital equipment falls exceedingly slowly, as Cassel has himself pointed out in *The Nature and Necessity of Interest*. It would therefore be possible for the banking system to create tremendous amounts of purchasing power before the real yield on capital would fall so much as 1 per cent. In the second place, the demand for capital is not determined by its real yield—which may be admitted to fall—but by the money yield. Thus, if the real yield of capital falls, but prices rise faster than the fall in physical productivity, the money value of the yield will continue to rise. For this reason there is no tendency in a too low bank rate to correct itself solely by satisfying fully the demand for capital. Other forces, such as a rise in rates of remuneration, may reduce the monetary yield of capital, and bring the natural rate of interest into equilibrium with the prevailing bank rate of discount. In a society in which the quantity of deposit money is limited by the requirement of reserves, the discount rate is generally raised and brought

into equilibrium with the natural rate of interest long before any great fall has taken place in the real yield of capital.

The relationship between the discount rate and prices has recently been discussed by Professor Pigou. A monetary system in which the money income of the community varies directly with the volume of employment of the factors of production, and in which the price level varies inversely with the efficiency of the factors of production, Pigou calls a standard monetary system. "The rate of bank interest which at any time conforms to the requirements of the standard monetary system may, for convenience and without any ethical implication, be called the *proper rate*."¹⁰ The monetary system of a country cannot always be made to conform to the standard monetary system because the prevailing discount rate cannot always be varied with changes in the proper discount rate. If forces are at work tending to an expansion in aggregate money income, the tendency can be counteracted by an increase in the prevailing discount rate; but if forces tend to a contraction in aggregate money income, the tendency cannot always be counteracted, since the proper discount rate under such conditions may be negative. However, public works expenditure, by increasing the proper discount rate, may raise it to a positive level and may make possible the restoration of equality. In actual practice, banking systems operated for profit tend to allow the prevailing bank rate of discount to rise and fall less than the proper discount rate with changes in the real demand for the factors of production. For this reason, changes in income, not attributable to the volume of employment, and in prices, not attributable to the efficiency of the factors of production, are prevalent in modern monetary societies.

¹⁰ A. C. Pigou, *The Theory of Unemployment*, p. 211.

4. *Why Prices Rise and Fall*

In the earlier discussions of the discount rate and the price level it was assumed that prices rose with lower discount rates because the lower discount rate stimulated borrowing and thus increased the quantity of money in the community. Of course, the quantity of money does not of itself affect prices. It can do so only by affecting the expenditure of the community. The discount rate is one factor determining whether the available or potential supply of money will be placed in the possession of those who wish to use it. But the discount rate affects the price level in other ways than by affecting the quantity of money. The importance of these other means is particularly emphasized by Keynes. Altho there is in general a correspondence between a reduction in the discount rate, an increase in the quantity of money, and a rise in prices, the correspondence is not invariable, and the rise in prices is not in proportion to the increase in the quantity of money. Qualifications must be introduced to account for the divergence of the change in prices from the change in the quantity of money; and when this is done, the theory of the relation of the discount rate to prices has in fact become a new one.

According to Keynes, the method by which the discount rate affects prices is by altering the relation of saving to investment. The various rates of interest on loans are all inter-related. The supply of and demand for loans for long and short periods, to some extent form a composite supply and a composite demand. If the rates of interest are materially different for long and short periods, loanable funds tend to be withdrawn from the low rate period and tend to be offered to the high rate period. Similarly, persons wishing to borrow tend to shift their demand for loans from the high

rate to the low rate period. That is not to say that there is complete interchangeability of supply and demand for long and short period loans, but there is sufficient interchangeability to bring about a sympathetic variation of the different interest rates.¹¹ When banks reduce the discount rate, the effect is ultimately to bring about a reduction in the long period interest rate. A fall in the long period interest rate increases the present value of durable goods, since their future uses are discounted at a lower rate. Thus a fall in the discount rate eventually leads to a rise in the price level of investment goods and an increase in their production. As the production of investment goods increases, without a corresponding change having taken place in the volume of savings, the price level of consumption goods also rises. Conversely, a rise in the discount rate increases the long period interest rate, reduces the price level of investment goods, decreases the expenditure of business men on the production of investment goods, and eventually lowers the price level of consumption goods.¹²

Keynes believes that this view of the relation of the discount rate to prices was to some extent perceived by Marshall and to a greater extent by Wicksell. On several occasions Marshall stated that a reduction in the discount rate increases speculation, and that the funds made available thru a lower discount rate come into the hands of business men who use

¹¹ The interchangeability of supply and demand for long and short period loans is not equally strong in both directions. For instance, it is more likely that funds available for long period loan will be diverted to the short period market than that funds available for short period loan will be diverted to the long period market. Generally speaking, the interest rate on short period loans is lower than on long period loans. This is probably due to the fact that the present value of short period loans can fluctuate less than the present value of long period loans. Cf. A. Marshall, *Official Papers*, p. 272.

¹² J. M. Keynes, *A Treatise on Money*, I, 13.

them for purposes of investment, for starting new businesses, new factories, new railways, and so on. In Wicksell, the approach of Keynes is more clearly visible. Wicksell finds the direct connection between prices and the discount rate in the intervention of money in lending and investment. Thus it happens that real capital is not borrowed and lent, but is bought and sold. An increased demand for capital is therefore not only an increased demand for loans—increasing the loan rate of interest—but also an increased demand for goods—increasing the prices of capital goods. One other connection between the discount rate and prices is recognized by Wicksell. If business men have been selling goods on terms requiring future payment, a fall in the discount rate raises the present value of the price at which the goods are sold.¹³ And in a later article his anticipation of Keynes is nearly complete. He said: "If the rate of discount remains low, the interest on long loans is sure to go down too; building companies and railway companies will be able to raise money, say at 4 per cent instead of 5 per cent, and therefore, other things being the same, they can offer, and by competition will be more or less compelled to offer for wages and materials, anything up to 25 per cent more than before, 4 per cent on £125 being the same as 5 per cent on £100."¹⁴

5. Statistical Evidence

There can be little question that Keynes and Wicksell have shown the manner in which the discount rate affects the price level. It is quite certain that a fall in the discount rate does not immediately result in an increase in the quantity of money. On the contrary, the fall in the discount rate

¹³ K. Wicksell, *Geldzins und Güterpreise*, pp. 125; 84.

¹⁴ K. Wicksell, "The Influence of the Rate of Interest on Prices," *Economic Journal*, 1907, p. 216.

is likely to be due to the larger reserves of the banking system following a decrease in the quantity of deposit money. After the discount rate has been reduced, there is an increase in the quantity of deposit money; but this seems to follow the rise in prices rather than to cause it. The relation of the discount rate to prices is direct, and not thru the quantity of money. The discount rate affects the long period interest rate and thus the prices of durable goods, and eventually consumption goods. It is quite difficult to show this relationship statistically. That there is some causal relation is indicated by the following table giving the interest rate on prime commercial paper and the price of an issue of government bonds. It seems evident that the price of bonds—similar in some respects to investment goods—varied inversely with changes in the short period interest rate.¹⁵ It must also be noted that the effect of the interest rate on the price of bonds is more limited than its effect on the price level of the most durable goods, because the principal amount of the bond is repaid at maturity, which prevents the market price of bonds from varying inversely in proportion to the long period interest rate.

The Short Term Interest Rate and Government Bonds,
1926 to 1933

Year and Quarter	Short Term* Interest Rate	Government Bonds**
1926, 1st Quarter	4.34 per cent	103.49
2nd "	4.09 " "	103.93
3rd "	4.34 " "	103.55
4th "	4.54 " "	104.46

¹⁵ Cf. B. H. Beckhart's suggestion that a change in the bank rate affects the price of bonds. *Discount Policy of the Federal Reserve System*, p. 56, and a similar suggestion by A. A. Young, *Economic Problems New and Old*, p. 68.

The Value of Money

Year and Quarter		Short Term* Interest Rate	Government Bonds**
1927, 1st Quarter	.....	4.17 per cent	106.66
2nd	"	4.17 " "	108.29
3rd	"	4.08 " "	108.35
4th	"	4.00 " "	109.46
1928, 1st Quarter	.....	4.04 per cent	110.64
2nd	"	4.59 " "	109.19
3rd	"	5.38 " "	106.18
4th	"	5.42 " "	106.32
1929, 1st Quarter	.....	5.59 per cent	104.09
2nd	"	6.00 " "	103.58
3rd	"	6.13 " "	102.96
4th	"	5.67 " "	105.73
1930, 1st Quarter	.....	4.63 per cent	107.04
2nd	"	3.71 " "	107.66
3rd	"	3.08 " "	107.94
4th	"	2.92 " "	108.23
1931, 1st Quarter	.....	2.67 per cent	107.17
2nd	"	2.17 " "	108.19
3rd	"	2.00 " "	107.75
4th	"	3.54 " "	101.48
1932, 1st Quarter	.....	3.84 per cent	97.85
2nd	"	3.13 " "	101.16
3rd	"	2.29 " "	103.28
4th	"	1.71 " "	103.96
1933, 1st Quarter	.....	1.88 per cent	105.02
2nd	"	2.18 " "	104.66
3rd	"	1.50 " "	106.14
4th	"	1.29 " "	104.19

* Reserve member banks' interest rate on prime commercial paper, 4 to 6 months.

** Treasury 4's, Series of 1944-54.

A statistical study of the relation of prices to the discount rate would require information on the proper discount rate that we do not possess. It is therefore futile to attempt to prove or disprove this relationship by direct correlation of prevailing discount rates with the price level.

6. *A Criticism of the Theory*

There is undoubtedly a sense in which it may be said that the price level is determined by the relation of the prevailing discount rate to the proper discount rate. For if the prevailing discount rate is reduced below the proper rate, forces are at work tending to raise prices; and conversely, if the prevailing discount rate is raised above the proper rate, there is a tendency for prices to fall. Altho there is a causal relationship between the discount rate and prices, it is incorrect to say that *the* cause of higher or lower prices is solely a movement of the discount rate. A suggestion of this objection is found in the commonly made criticism that low discount rates are frequently found with low prices, and high discount rates with high prices. Wicksell noted the objection and observed that it is not the high or low rate, but its relation to the natural rate that is of importance. Marshall also noted the objection, and his view is indicative of the true sense in which it may be said that the discount rate is associated with the price level. A low discount rate is not always accompanied by high prices. It depends on whether the low rate is due to the unprofitableness of business, or to an increase in the supply of loanable funds. In the first instance, a low discount rate cannot raise prices; in the second, it will generally raise prices after an interval during which it takes effect.¹⁶ When the expense of producing a unit of output is less than or equal to the prevailing price, a

¹⁶ A. Marshall, *Official Papers*, p. 274.

fall in the discount rate, raising as it does the price of investment goods, induces business men to extend their borrowing and to increase their production. When the expense of producing a unit of output exceeds the prevailing price, a reduction in the discount rate may not be effective in raising prices.

There is undoubtedly a proper discount rate at which prices can be kept from falling and be made to rise to equilibrium. But this rate, as Pigou shows, may be negative; and there is no means by which banks, in business for profit, can be induced to provide loanable funds at negative interest. The real difficulty under such circumstances is that the proper discount rate is too low—not that the prevailing rate is too high. The rate of interest is not a simple phenomenon, independently determined by the quantity of capital available for loan. The demand for capital is closely related to the rates of remuneration of the other factors of production, for all factors must be used jointly. Thus, a fall in the rate of wages leads to an increase in the demand for capital and a rise in the rate of interest. Conversely, a rise in the rate of wages leads to a decrease in the demand for capital and a fall in the rate of interest. If there is a fall in the proper discount rate because of a rise in wages, and there is no corresponding decrease in the prevailing discount rate, there must be a fall in prices. But it cannot be said that the fall in prices is attributable to the prevailing high discount rate.

Because the proper discount rate is the complex of many forces, it is impossible, without detailed consideration, to attribute the rise or fall in prices exclusively to the prevailing discount rate. It is not always possible to say whether the disequilibrium between the proper and prevailing discount rates is due to the discount rate or to the rate of wages. One test, perhaps, can be applied. If the proper discount rate

is such that a continuance of the prevailing rate at the proper rate would, after a time, lead to a decrease in the volume in which savings are supplied, the cause of the disequilibrium lies not in an excessive discount rate, but in a high wage rate. This would seem to be the only satisfactory test—whether the proper discount rate is above or below the normal supply price for capital.¹⁷ Altho a movement of the prevailing discount rate can always bring about a halt in the fluctuation of prices, except where the proper rate is negative, an equilibrium established in this manner would not continue very long if the proper discount rate were itself not adjusted to the fundamental forces affecting the supply of and demand for capital over a moderate period of time. Temporary equilibrium therefore can be established by keeping the proper and prevailing discount rates equal; but continued equilibrium requires that the proper discount rate be at that level at which the community's need for savings will be adequately but not excessively supplied in the future.

A more fruitful approach to the relationship between the discount rate and the price level can be found in the real rates of remuneration of all the factors of production. If the real rates of remuneration for a unit of output rise beyond the equilibrium level, forces will be at work tending to reduce prices—for it is the excess total remuneration of all factors of production that lowers the proper discount rate; and conversely, if the real rates of remuneration for a unit of output fall below the equilibrium level, forces will be at work tending to raise prices. When the real rates of remuner-

¹⁷ If there were a supply price for labor, the same test could be applied by way of wages. It is probable, however, that the long run rate of wages is determined by the progress of invention and by the long run rate of interest, the supply of labor being determined by social forces independent of rates of wages.

ation are too low, business men can increase their profits by extending production; and when the real rates of remuneration are too high, business men can decrease their losses by restricting production. Thus the real rates of remuneration determine the rate at which credit is created and repaid, and in this manner determine the price level.

This approach can be applied very effectively with Keynes's monetary equations. A rise in the monetary expenses of producing a unit of output normally leads to a rise in prices. But if the rise in monetary expenses is such that real rates of remuneration are increased until they are above the equilibrium level—that is, the real output—business men must incur losses. A rise in real rates of remuneration brings about a contraction of investment so that a deficiency of investment relative to savings may appear. This deficiency is a function of real rates of remuneration, assuming productive efficiency to be constant, being larger or smaller with corresponding changes in real rates of remuneration. This function may be called the elasticity of investment. If the deficiency of investment per unit of output were precisely equal to the excess real remuneration to the factors of production per unit of output, prices would always be stable, altho the volume of production and the employment of the factors of production would vary. In fact, however, the elasticity of investment is relatively large, so that a small excess in the real rates of remuneration per unit of output leads to a large deficiency in investment per unit of output, and therefore to a fall in prices; and conversely, a small deficiency in the real rates of remuneration per unit of output leads to a large excess of investment per unit of output, and therefore to a rise in prices.¹⁸

¹⁸ In the terminology used by P. W. Martin, a rise in the real rates of remuneration above the equilibrium level increases the remunerative price

A Note on the Theories of the Value of Money

1. The many theories of the value of money indicate the diversity of the factors affecting the general level of prices, and of the opinions as to their importance. Altho there are fundamental differences in the various theories, they must be regarded as complementary rather than alternative explanations of the value of money. To some extent these theories are only different views of the same phenomena. To Fisher, for instance, a change in the quantity of money is a fundamental factor affecting prices; to Hawtrey it is important only as it affects consumers' income and outlay. Nevertheless, Hawtrey agrees that a change in the quantity of money must inevitably affect consumers' income and outlay. Similarly, to Fisher a change in the velocity of money is an independent factor affecting prices; to Pigou it is a change in the quantity of real resources the community chooses to command with its holdings of money; and to Hawtrey it is a change in the rate at which consumers' income and outlay go on.

Attempts have been made to convert the various equations mathematically, altho this involves doubtful assumptions regarding the relationship of the quantity of money to the money income (income velocity) and to the money expenditure (circuit velocity) of the community. In fact, the terms employed in the various equations are so differently defined that it is impossible to convert them mathematically except by qualifications that change the significance of the equations and modify the fundamental theories. Some of the differ-

level, but it leads to a deficiency of purchasing power in excess of this increase in the remunerative price. Conversely, a fall in the real rates of remuneration below the equilibrium level decreases the remunerative price level, but it leads to a superabundance of purchasing power in excess of this decrease in the remunerative price.

ences in the various theories of the value of money are too basic to be explained away.

Nearly all the quantity theories, except Fisher's, hold that the relation of the quantity of money to prices is not direct and proportional. A change in the quantity of money will bring about a proportional change in prices only after a considerable time has elapsed, and only if business conditions have not changed in the meantime. In actual practice a change in the quantity of money has repercussionary effects on every important factor affecting the value of money; and the change in the price level is therefore seldom, if ever, precisely in proportion to the change in the quantity of money.

The usefulness of the various theories of the value of money depends upon the light they throw on the means of controlling variations in prices and production. All quantity theories are agreed that a change in the quantity of money must sooner or later affect incomes, expenditures and prices. The theories of Hawtrey and Keynes are particularly useful in indicating how changes in the price level are brought about and how they can be controlled. According to Hawtrey, a change in the relative rate of creation and repayment of bank credit affects prices. With given conditions of employment and profits, a change in the rate of discount will bring about an opposite change in the net creation of credit. Keynes has shown that the movement of prices depends upon changes in the cost of production and in the relative volume of investment and savings. With given conditions of employment and costs, a decrease in the rate of interest will increase the volume of investment relative to savings, and will bring about a rise in prices. Conversely, an increase in the rate of interest will decrease the volume of investment

relative to savings, and will bring about a fall in prices. Control of interest and discount rates is therefore an important means of regulating the price level and changes in the price level.

2. The manner in which investment is involved in all stages of the productive process has been given insufficient consideration by writers on monetary theory and monetary problems. Production in a highly capitalistic society is spread over time. It is impossible to increase the volume of finished goods unless at some previous time there has been an increase in the production of half-finished goods, and still more previously an increase in the volume of goods in the earliest stages of production. Every expenditure of business men in carrying on production—whether on capital equipment, raw materials or labor—is investment. The sale of the product of business men—whether to other business men engaged in later stages of production, or to ultimate consumers—may be regarded as negative investing (Jevons used the term *uninvesting*). If the sale of the product is to other business men engaged in later stages of production, the negative investment of the sellers is offset by the positive investment of the buyers. The total current investment of business men is shown by their expenditure in increasing the volume and the value of their products; and the net current investment of business men is the amount by which this total expenditure on production exceeds the cost of the goods sold to ultimate consumers.

The importance of the earlier stages of production in determining the volume of investment suggests one reason why an increase or decrease in investment tends to be cumulative. If the output of finished goods in a community is increasing, there must be a tendency for production to in-

crease first and most rapidly in the earlier stages of production, for the output of finished goods depends on the prior production of half-finished goods and goods in the earliest stages of production. As the total volume of investment is related to production, and the volume of negative investment is related to the sale of finished goods, the net current investment in the community must continue to increase so long as the production of half-finished goods and goods in the earlier stages of production increases more rapidly than the output of finished goods. Further, as the increase in investment increases profits and induces further investment, the process tends to be cumulative.

On the other hand, if for some reason the output of finished goods in a community is falling, there must soon be a tendency for production to decrease more rapidly in the production of half-finished goods and goods in the earliest stages of production. The net current investment in the community must decline so long as the production of half-finished goods and goods in the earliest stages of production decreases more rapidly than the output of finished goods. As the decrease in investment diminishes profits and induces a continued decrease in investment, the process tends to be cumulative. This cumulative tendency can be arrested only by the appearance of a new factor—say, an invention or discovery or an expansion of credit—that brings about an increased production of goods in the earlier stages of production.

The effect on prices of the increase or decrease in net current investment must depend upon the uses to which the community puts its changing money income. If the community saves out of its current income (the total volume of investment) an amount precisely equal to the net current investment, prices must remain stable. In the first instance,

when the net current investment was increasing, the tendency toward higher prices could be offset only by a corresponding increase in the community's savings. In the second instance, when the net current investment was decreasing, the tendency toward lower prices could be offset only by a corresponding decrease in the community's savings. Whenever the net current investment is negative, prices can be prevented from falling only if consumers (including the government) draw upon their cash balances (which constitutes negative saving) to an amount equal to the deficiency in net current investment.

Variations of these views are found in the studies of Foster and Catchings, and of such unorthodox writers on monetary theory as Douglas. In general, such writers place great emphasis—on the whole, unwarranted emphasis—on the difficulty of avoiding a fall in the price level because of the insufficiency of the expenditure of the community on finished goods. There is no reason for believing that the manner in which the money income and the money expenditure of the community are determined necessarily results in a tendency toward falling prices.

3. Having considered the causes of movements in prices, it is now possible to give a last consideration to the factors determining the normal level of prices—that level which would prevail if it were not upset by changes in the relative volume of savings and investment. The normal price level is determined by the money cost of producing a unit of output. Changes in the money cost of producing a unit of output can be brought about by changes in the efficiency of the factors of production and by changes in the money rates of remuneration of the factors of production.

In considering the forces that determine the prevailing

money cost of producing a unit of output it is necessary to revert once more to the quantity of money in a community. It has already been stated that the balances of money in the hands of business men are turned over to the factors of production in payment for their efforts; and the balances of money in the hands of consumers are turned over to business men in payment for the real income—consumers' goods and investments—they purchase. The rate at which money completes this round from producers to the factors of production is called the income velocity of money (defined as the ratio of the money income to the quantity of money); and the rate at which money completes its round from consumers to producers is called the circuit velocity of money (defined as the ratio of the money expenditure to the quantity of money). In a condition of equilibrium—where the consumers' income is equal to the consumers' outlay—these two velocities of money are identical. The money income of the community therefore depends upon the quantity of money and the income velocity of money.

It can be shown that there is a normal income velocity of money that does not change rapidly in short periods. For example, from 1923 to 1927 the income velocity of money in the United States, according to Currie, varied from a low of 2.99 to a high of 3.08, a variation of only slightly more than 3 per cent in a five-year period. Changes in the total money income of the community are therefore largely dependent upon changes in the quantity of money. In gold standard countries, the ultimate limitation on the quantity of money of all kinds is the stock of monetary gold, which in the long is determined by the production of gold. If the quantity of money in the community is insufficient to permit a rise in the money rates of remuneration of the factors of

production with an increase in efficiency, the money cost of producing a unit of output must fall, and with it the normal price level. On the other hand, an increase in the quantity of money in the possession of business men induces them to raise money rates of remuneration in their competition to secure the services of the limited supply of the factors of production. If these higher money rates of remuneration are not offset by an increase in the efficiency of the factors of production, the cost of producing a unit of output must rise, and with it the normal price level.

Cassel's theory that stability of the normal price level is dependent upon an annual increase of approximately 3 per cent in the existing stock of monetary gold can be true only if this increase of gold brings about an expansion of the quantity of money which together with the slowly rising income velocity of money is sufficient to permit an increase in the money rates of remuneration of the factors of production precisely equal to their increase in efficiency. Much the same may be said of the theory of Warren and Pearson that the normal price level is determined by the ratio of the index of the stock of monetary gold and the index of the physical volume of production. The chief source of error in their theory is the neglect of the income velocity of money.

PART FOUR

Monetary Problems

Chapter XIII

Inflation and Deflation

1. *Prices, Expenses and Profits*

FEW monetary questions have received greater attention than those associated with the problems of inflation and deflation, and rising and falling prices. The terms inflation and deflation have generally been used without precise definition. Altho many economists have recognized that inflation may result from an increase in the stock of monetary gold or from an increase in the amount of bank credit, inflation is ordinarily regarded by most people as a rapid rise in the general level of prices caused by an increase in the supply of lawful money issued by authority of government. This meaning has had sufficient historical accuracy to make it acceptable for most purposes. Beyond doubt, the principal reason for inflation in its most extreme forms has been the extraordinary needs of governments, particularly in war and post-war periods. In modern times these extraordinary financial needs have frequently been met in large part by the issue of lawful money by authority of the state. Similarly, deflation is ordinarily regarded by most people as a rapid fall in the general level of prices caused by a decrease in the supply of lawful money issued by authority of government; and it is generally associated with the monetary policy of governments after important wars. To restrict the terms inflation and deflation to this limited meaning is to deny the relationship of effects of the same kind induced by causes

of the same type. As less emphasis is placed upon the extremely spectacular instances of inflation and deflation, and note is taken of the frequent but moderate instances of inflation and deflation, it becomes evident that government finance is not necessarily related to these phenomena.

Altho inflation and deflation are generally associated with an increase and decrease in the quantity of money, and with rising and falling prices, they may be entirely independent of changes in money and prices. Inflation or deflation may be accompanied by a constant, an increasing, or a decreasing quantity of money; and by stable, rising, or falling prices. Inflation and deflation are not a relationship of prices at one time to prices at another time; but a relationship of prices at any time to expenses of production at the same time. If prices and expenses are such that business men are securing profits—net income is more than normal business earnings—that is inflation; and if prices and expenses are such that business men are sustaining losses—net income is less than normal business earnings—that is deflation. It is not of fundamental importance whether the change in business profits is due to an increase or decrease in the quantity of money, and to rising or falling prices. It is the existence of business profits and business losses that is essentially characteristic of inflation and deflation.¹

Business profits or business losses may arise from a change in prices or a change in expenses of production. It is useful to distinguish the inflation or deflation that is largely due to changes in prices from that which is largely due to changes in costs. The emergence of profits or losses from a rise or

¹ J. M. Keynes, *A Treatise on Money*, I, 155-156, distinguishes three types of inflation and deflation: commodity inflation and deflation—a rise or fall in prices; income inflation and deflation—a rise or fall in money incomes; and profits inflation and deflation—a rise or fall in profits, what is here called simply inflation and deflation.

fall in prices may be called absolute inflation and deflation; and the emergence of profits or losses from a fall or rise in the unit costs of production may be called relative inflation and deflation. A change in prices may be attributed to many factors—to a change in the quantity of lawful money, or of deposit money, or in the community's desire to command real resources with money, or in the income and outlay of consumers, or in the rate of saving or investment; and any of these may result in absolute inflation or deflation. A change in the unit cost of production may be caused by a change in the efficiency or in the money rates of remuneration of the factors of production; and either of these may result in relative inflation or deflation.² Conceivably, absolute and relative inflation or deflation may go on at the same time—prices rising as costs fall, or prices falling as costs rise.

The essential feature of inflation or deflation is the existence of business profits or losses. A period of inflation is characterized by an extension of activity on the part of business men. There is an increased demand for the services of the factors of production, and for the raw materials of production. Invariably, there is a large increase in investment due to the greater profitability of business. Generally, there is an increase in output, altho this is more likely to characterize the early than the late stage of inflation. Deflation is marked by opposite tendencies. Business men restrict their activity; there is a decreased demand for the services of the factors of production, and for the raw materials of production. There is a very large decrease in investment, due to the unprofitability of business; and there is a decrease in output. Eventually, the price level of goods and the expense

² The terms absolute and relative inflation have been used by many economists. Cf. the paper by G. Haberler, *Gold and Monetary Stabilization*, p. 55.

level of production come into equilibrium, and inflation or deflation comes to an end.

Just as it is possible to have an inflation or deflation without a change in prices, so it is possible to have a rise or fall in prices without inflation or deflation. A change in prices accompanied by a corresponding change in costs can have no effect on industrial equilibrium. A rise in prices without inflation may be called depreciation of money, that is, a fall in its purchasing power; and similarly, a fall in prices without deflation may be called appreciation of money, that is, a rise in its purchasing power. Changes in prices may be due to forces operating from the side of money, or from the side of goods. A change in prices due to a change in the supply of money, or the community's need for money, may be called an absolute change in prices; and a change in prices due to a change in the real costs of producing goods may be called a relative change in prices.³ Altho changes in prices that do not affect profits can have no effect upon the volume of employment and output; such changes do affect the relations of debtors and creditors, and the well-being of the community.

³ On the question of absolute and relative changes in prices, Marshall wrote: "The appreciation of gold simply means a fall of general prices. . . . But there is no doubt that the two are used in different senses among the public. . . . When an appreciation of gold [is] contrasted with a fall of general (gold) prices . . . I then regard it as measured by the increase in the power which gold has of purchasing labor of all kinds—that is, not only manual labor, but the labor of business men and all others engaged in industry of any kind. To give definiteness to this explanation I will take an example. Suppose that the rise in the purchasing power of gold as measured by the general prices of commodities, is 30 per cent; suppose the rise in the power which gold has of purchasing work, or in other words, the fall in average gold earnings, is 12 per cent; then in my use of the term, the fall of prices is due to the extent of 18 per cent to improvements in production, and to the extent of 12 per cent, to a rise in real value or to an appreciation of gold, in that use of the term in which it is contrasted with a fall of general prices." A. Marshall, *Official Papers*, pp. 32-33.

2. *Evils of Inflation and Deflation*

"If for any reason right or wrong," says Keynes, "the business world expects that prices will fall [relative to the expenses of production], the processes of production tend to be inhibited; and if it expects prices to rise [relative to the expenses of production], they tend to be overstimulated."⁴ The reason lies deep in the fundamental structure of competitive economic society. Production is undertaken by business men with the object of securing a profit. A rise in prices relative to expenses of production increases business profits. To take advantage of this favorable situation, business men extend their uses of the factors of production: they hire more labor, borrow more capital and rent more land. Everyone is engaged in working more intensively; but it is questionable whether laborers as a class would have been willing to undertake this more intensive activity, particularly at the lower real rates of wages. The rise in money rates of remuneration necessary to restore equilibrium between the price level and the expense level is retarded because many expenses of production are fixed by contract and custom, and because labor tends to think in terms of money.

On the other hand, when prices fall relative to the expenses of production, business men suffer losses. In order to minimize losses, business men restrict their uses of the factors of production: they hire less labor, borrow less capital and rent less land; and they restrict their purchases of the raw materials of production.⁵ In this manner, deflation brings

⁴ J. M. Keynes, *A Tract on Monetary Reform*, p. 32.

⁵ "The chief of the evil effects produced by a diminishing money supply is, in my humble opinion, to be seen in the impairment of enterprise on the part of the producer and the exchanger of wealth, due to falling prices. It must be remembered that, under the modern system of commerce and industry, the sole motive for the production of wealth is found in the anticipated profits of business. . . . In such a case, even a slight move-

about a contraction of activity on the part of the factors of production. This contraction is much greater in relation to new enterprises that would ordinarily have been undertaken, for in old enterprises where business men operate with large amounts of fixed capital, it may be uneconomical to reduce the employment of the factors of production for a considerable time. In general, deflation must bring about a decrease in employment, and as deflation continues this decrease becomes greater. Altho it may be more profitable to business men and even necessary for their solvency to decrease production and the employment of the factors of production, their action impoverishes society as a whole.

It is sometimes argued that the increased production during inflation is good for society, because it increases the national income. This is usually not so, for the extension of production requires the expenditure of real effort by the factors of production, and the cost of this additional effort may be in excess of the utility that society secures from the additional product. Further, a large share of this increased product is given to business men in the form of abnormal profits, and not to those who provide the additional real effort. The increase in production during a period of inflation is probably exaggerated. Some activity of business men at such a time is devoted to speculative dealing in and holding of goods and securities, and does little to increase the real national income. Besides, the standard of efficiency of business management is lower during periods of inflation, for inefficient producers attribute the abnormal profits to their skill as business men, and extend their undertakings

ment in the direction of falling prices between the time when materials are purchased and manufacture undertaken, and the time when goods are to be marketed and paid for, may, if persisted in, become a very serious matter." F. A. Walker, *Discussions in Economics and Statistics*, p. 233.

beyond their capacity for successful management. The large number of business failures immediately after the end of a period of inflation indicates that management has not been very efficient.

A rise or fall in prices in proportion to changes in the cost of production can have no effect, other than a temporary one, on the volume of production and the employment of the factors of production, for the equilibrium between the price level and the expense level is not disturbed and the net income of business men remains equal to their normal business earnings. A slight fall in prices below the normal expenses of production will not bring about a large decrease in output if the net income of business men is not reduced too much. A slight decrease in production there must be, for some business men will reduce output for the purpose of maintaining prices; but in industries in which there is a large investment in fixed capital, operations will tend to be maintained at the usual level. Even this small decrease in the volume of production may not continue for long, for a slight deflation is easily overcome by the progressive increase in the efficiency of the factors of production. A serious condition of disequilibrium generally requires more than a small difference between the price level and the expense level.

In the discussion of the effect of inflation and deflation on production, some of the distributional effects were anticipated. Thus, it was stated that business men secure profits in excess of business earnings during inflation, and suffer losses during deflation. The excess profits during inflation are at the expense of the other factors of production; and conversely, some of the losses during deflation are gains to the other factors of production. By far the greater part of the losses during a period of deflation is not offset by gains of

other factors of production. If the transfer of wealth during alternate periods of inflation and deflation were entirely adventitious, it would be economically undesirable; and it would be far better for the community if the factors of production were always to secure the equilibrium rates of remuneration—the rates at which all factors of production can be fully, but not excessively, employed. The relative evils of inflation and deflation from the distributional point of view depend upon how they affect the division of the national income among the poor and the rich.

It is generally assumed that during inflation, efficiency rates of real wages decrease. While this is usually true, it is not always true; for even if efficiency rates of real wages increase, it is still possible to have inflation if expenses of production decrease relative to prices, because of lower real rates of interest and lower real rents. During the latter part of the war and post-war inflation, working men in Great Britain and in the United States secured higher real wages, at a time when the available wealth of the community was not growing at a normal rate. As Keynes suggested, the business man found "it was worth his while to pay ransom, and to share with his work-men the good fortune of the day." Also, some of the excessive profits of business men during inflation is recaptured by government in the form of income and inheritance taxes, and a large part of this revenue is expended for the well-being of the poor. It is not inconsistent with inflation for the poor of the community to find their share of the national income increasing, particularly if there is an increase in employment. Nevertheless, the general tendency is rather for efficiency rates of real wages to fall during inflation and to rise during deflation, altho the advantage of the rise during deflation is more

than offset by the decrease in the volume of employment.

Regardless of inflation and deflation, a change in prices alters the relationship of debtors and creditors. If prices rise, it becomes possible for debtors to repay their debts with less goods and services, and generally with less real effort; and conversely, if prices fall, the repayment of a debt requires more goods and services, and generally more real effort. In considering the good and evil effects of rising and falling prices from the distributional point of view, it is necessary to consider the effect of changing prices upon the division of the national income between the active and the passive economic classes, and between the rich and the poor. A rise in prices undoubtedly results in a transfer of wealth from passive owners, capitalists and landlords, to active users, business men and occasionally laborers. "The tendency of money to depreciate has been in past times a weighty counterpoise against the cumulative results of compound interest and the inheritance of fortunes. It has been a loosening influence against the rigid distribution of old-won wealth and the separation of ownership from activity. By this means each generation can disinherit in part its predecessors' heirs."⁶ This effect of rising prices, to transfer wealth from the owning to the using classes, is undoubtedly desirable, if it does not diminish too much the desire of the owning classes to save and to lend.

The good or evil that results from a transfer of wealth between debtors and creditors depends largely on whether the rich or the poor increase their share of the national income. Generally speaking, the most important debtors are the corporations engaged in industry, and governments. So far as corporate debt is concerned, the debtors are the holders

⁶ J. M. Keynes, *A Tract on Monetary Reform*, p. 28.

of common stock in corporations. To a large extent holders of common stocks are also the owners of bonds, and many people tend to keep a ratio of bonds to stocks not far different from the ratio of total corporate indebtedness to total corporate common stock. Such owners of stocks and bonds are both creditors and debtors, and in so far as debts consist of corporate bonds no great injustice is done by the transfer of wealth thru changes in prices. Similarly, as regards government debt, the tendency to hold government securities is approximately coincident with the tendency to pay taxes. What government bondholders gain or lose as creditors they tend to lose or gain as taxpayers. The common view that the rich are largely creditors is fallacious. It is much more likely that the rich tend to be debtors, particularly in this country where no social disability is attached to being actively engaged in business.

Nor is it generally true that the poor tend to be debtors. As holders of insurance policies and of bank savings they are obviously creditors. In their most important capacity, as working men, they are creditors to the extent that their money rates of wages tend to be rigid, and their employment is not influenced by a change in prices. One other important group in the creditor class is public institutions and trusts, largely operated for the benefit of the poor, whose funds are invested in specified types of bonds. The loss to such institutions from the decreased purchasing power of their income from bonds, with moderately rising prices, is probably more than offset by the larger gifts for endowment that are made at such times. The most important debtor position of the poor is as owners of mortgaged homes and farms; and it is exceedingly questionable whether this is equal to the creditor position of working men as holders of

insurance policies and of bank savings. While rising prices tend to transfer wealth from the passive to the active classes, they tend also to transfer wealth from the poor to the rich. It is probable that rising prices increase the inequality in the distribution of wealth, and that falling prices—particularly slowly falling prices—tend to decrease the inequality in the distribution of wealth.

The community's utilization of the national income in consumption, saving and investment is to a large extent affected by inflation and deflation, and by rising and falling prices. It has already been said that the rate of saving depends on the real rate of interest—the nominal rate of interest and the rate of increase or decrease in the value of money. The nominal rate of interest is relatively constant for extended periods, so that it is generally true that changes in the real rate of interest depend upon changes in the value of money. An increase in the value of money—a fall in prices—brings about an increase in the rate of saving; and conversely, a rise in prices brings about a decrease in the rate of saving, relative to that which would have prevailed if the same income were accompanied by stable prices.

The volume of investment in a community depends on the opportunity for profits, so that investment increases during inflation and decreases during deflation. If the volume of savings exceeds the volume of investment, profits fall and there is deflation; and the sacrifice of the community in saving is to some extent abortive, for the savings cannot be used in further production while the factors of production are unemployed. On the other hand, if the volume of investment exceeds the volume of savings, profits rise and there is inflation; and the community is compelled to devote a greater part of its efforts to the production of goods for

investment than it would have done under equilibrium conditions—that is, there is forced saving. The excessive volume of investment is made possible by decreasing the real rates of efficiency earnings of the factors of production below the equilibrium level. The situation is most extreme when inflation is combined with rising prices—absolute inflation—and when deflation is combined with falling prices—absolute deflation. At such times the volume of forced savings and of abortive savings is largest. In all probability the most balanced growth of real capital is during periods of equilibrium in business activity: when the factors of production are fully, but not excessively, employed, and when business men receive only their normal business earnings.

The evils of inflation and deflation, and of rising and falling prices are exceedingly great. The general interests of a country are undoubtedly best promoted by industrial equilibrium and by stability in prices. As between inflation and deflation, the evils of the latter are greater, because the magnitude of the national income is smaller during deflation, and because working men are in a better position to protect themselves from over-employment during inflation than from under-employment during deflation. As between rapidly falling and rapidly rising prices, the evils of the latter are greater, because the inequality in the distribution of wealth is increased by rising prices and decreased by falling prices, and because money rates of wages tend to be rigid, so that for short periods real wages vary inversely with changes in the price level. Absolute inflation and deflation are probably more harmful than relative inflation and deflation, for they combine instability in prices with disequilibrium in business. There can be little question that economic equilibrium and price stability are preferable to inflation and deflation, and to

rising and falling prices. It is the duty of the monetary authority of a country to manage the monetary system in such a way that economic equilibrium and price stability are maintained as far as possible; and of these, the more important object of monetary management should be to maintain economic equilibrium.

3. *Remedies for Inflation and Deflation*

A condition of inflation or deflation is caused by a movement of the price level or the expense level not offset by a corresponding movement of the other. To restore economic equilibrium it is essential to bring about equality of the price level and the expense level. This can be done by a movement of prices, a movement of expenses, or by a movement of both prices and expenses. In practice, a mild inflation is likely to be counteracted and equilibrium restored after a time by a rise in the expenses of production thru an increase in the money rates of remuneration of the factors of production. Similarly, a mild deflation is likely to be counteracted after a time by an increase in the efficiency of the factors of production, occasionally accompanied by a decrease in the money rates of remuneration, expenses of production thus falling to the equilibrium level. Generally speaking, therefore, mild inflation and deflation are remedied in a relatively short period of time thru appropriate changes in the cost of production brought about by the long period trend in real earnings and in the efficiency of the factors of production.

A moderately severe inflation or deflation cannot be expected to remedy itself by appropriate movement in the expense level. The rigidity in the rates of remuneration of the factors of production is so great that a long time must elapse before equilibrium can be restored by a rise in earnings dur-

ing inflation, or by a combined fall in earnings and increase in efficiency during deflation. Under such conditions equilibrium can be restored only by action designed to bring about a proper movement in the price level, supplemented perhaps by some movement in the expense level. The appropriate movement of the price level can probably be brought about by changing the rate at which bank credit is created and repaid—that is, thru variations in the prevailing discount rate. There is ordinarily no great difficulty in inducing a fall in the price level by this means. The raising of the price level to the equilibrium level is far more difficult, for not only may the proper discount rate be negative, but the necessity of maintaining the gold standard may prevent effective action, even when the proper discount rate is positive. In a gold standard country, the price level can be raised only in harmony with similar movements in other gold standard countries, for if one country should attempt to raise its price level to overcome deflation, it would soon find its gold reserves depleted; and if protection of reserves is regarded as of greater importance than the restoration of equilibrium, the attempt to raise the price level will have to be abandoned. It is possible, of course, that an initial movement in the price level of one gold standard country will induce corresponding movements in other gold standard countries, so that if all take similar action simultaneously, the price level in all countries can be brought into equality with the expense level. Nevertheless, the limitation upon the control of the price level imposed by the gold standard cannot be disregarded.

An extremely severe inflation or deflation requires a radical reversal in the monetary policy of a country if equilibrium is to be restored. In general, extremely severe inflation is caused by the use of the monetary system to provide gov-

ernment with the funds ordinarily raised by taxation and loans. The first step in halting a rapid rise in prices under such conditions is to balance the budget, so that dependence is no longer placed on the issue of notes, or on loans from the central bank. When the further issue of notes has been halted there will be a tendency for the price level to fall, for the community will have reduced the real value of its money balances to an inconveniently small amount, and in the course of time the real value of these balances will rise to the normal level that people wish to hold in the form of money. If the inflation has not been fantastically great, equilibrium will be restored after a time thru the continued rise in the rates of remuneration of the factors of production over an extended period. This occurred in France and Italy, where prices rose five-fold in the war and post-war inflations. However, if inflation has been carried to such an extent that the existing price and monetary system is completely disordered, it may be necessary to establish a new monetary system, converting the old note issue into a new note issue at a very small fraction of the nominal amount of the notes. This was done in Germany and Austria after their extreme inflations.

Generally speaking, an extremely severe deflation in gold standard countries is due to a secular change in the value of gold brought about by the increasing difficulty of providing adequate supplies of the money metal. It is clearly impossible to expect equilibrium to be restored under such conditions by a downward movement of the expense level. The fall in the real cost of producing a unit of output is gradual; and to induce a long continued fall in the rates of remuneration of the factors of production would require a large amount of unemployment that is economically wasteful and socially impossible. Nor can an extremely severe deflation in gold

standard countries be overcome by an expansion of credit, for even if all gold standard countries were to take similar action simultaneously, they could not raise prices very much or for very long if the real cost of producing gold has increased considerably. Under such conditions the simplest means of providing the basis for the necessary monetary expansion is to abandon the gold standard or to devalue the currency—that is, to reduce the fine gold content of the monetary unit.

4. *Devaluation*

The evils of deflation and falling prices are not peculiar to our time. They have been experienced and vaguely understood in other periods of the world's history. The production of gold and silver during the Middle Ages, and for two centuries after, was negligible; and the supply available for monetary uses was steadily diminished. Aside from the loss by abrasion, the supply of money was depleted by export and by diversion to non-monetary uses. The early trade with the East, following the Crusades, probably resulted in an export of gold and silver. In the fifteenth century, the increase in royal hoards of gold and silver further diminished the supply of money. It is probable that Henry VII put into his treasury approximately half a million pounds a year, a tremendous sum for the England of his time. The large increase in the real wealth of the community at this time also made fashionable the use of the precious metals in art and industry. During the fourteenth and fifteenth centuries, the money metals were used to make gold lace and cloth, gold and silver trappings, and gold and silver plate. At the same time, the growth of population and trade, and the replacement of the feudal economy by a money economy, placed a great strain upon the limited supply of money.

To conserve the supply of precious metals for monetary use, various restrictions were placed on the export of gold and silver, and on the melting of coin. These restrictions bear a striking resemblance to modern methods of controlling the supply of monetary gold. An order of Edward III, dated 1335, contains the following provisions:⁷

First, it is provided that no man of religion or other henceforth carry the sterling out of the realm of England, nor silver in plate, nor vessels of gold or silver, on pain of forfeiture of the money, plate or vessel that he shall carry, without special license from us.

And that no sterling half-penny or farthing be molten to make a vessel or other thing by goldsmiths or others on pain of forfeiture of the money so molten, and that the goldsmith or other who shall have so molten it, be put in prison and there stay until he shall have rendered to us the moiety of that which he shall have so molten, notwithstanding charter or franchise granted or used to the contrary.

Restrictions of this type are older than this proclamation, for there are records of search for gold and silver on outbound ships as early as the end of the thirteenth century. These restrictions on the export of gold and silver continued for a long time. The group of mercantilists known as the bullionists who advocated the complete prohibition of the export of the money metals may have had in view the danger of a continued fall in prices, and of a deflation. Probably the mercantilist arguments for a restriction on the export of the money metals were not so invalid as many economists have held. Similar restrictions on the export and the melting of

⁷ A. E. Bland, P. F. Brown, and R. H. Tawney, *Select Documents on English Economic History*, p. 218.

the money metals have continued to recent times. There are few countries today in which there is unrestricted freedom in the use of monetary gold.⁸

A more important method of minimizing the fall in prices and of avoiding deflation was devaluation of the coinage—the reduction of the fine metal content of the monetary unit. There is not an important country in the world that has not at one time or another used this method of decreasing the value of its money. In France, the franc (livre) was originally a pound weight of silver. In 1873, when France suspended the free coinage of silver, a franc contained approximately one-fiftieth of its original content of fine silver. The gold content of the franc of today is little more than one-fifth of its gold content of 1914. In England, the pound was originally a Tower-pound (11.25 Troy ounces) of silver. By a series of recoinages, the pure content of a unit of English money was reduced to less than half the original content in a period of little more than two hundred years. The diminution in the metallic content of coins has been going on from time immemorial, and it is likely to continue as long as nations have metallic monetary standards and there is danger of deflation.⁹

⁸ Aside from political and religious reasons, it is probable that the statutes regulating wages, interest, and other prices, were partly for the purpose of maintaining low expenses of production and thus of avoiding deflation.

⁹ An alternative method of reducing the fine content of coins was to increase the proportion of alloy while maintaining the same gross weight of the coin. A period of debasement of the coinage in this manner was generally followed by a recoinage in which the gross weight was reduced and the original fineness restored. This type of debasement was carried on in many ways, some extremely ingenious means being devised to disguise the debasement. Occasionally a core of base metal was covered with a thick plate of silver of standard fineness, thus retaining the appearance and the weight of the original coin. More commonly the percentage of alloy was increased until the base metal was sometimes so predominant as to give

There was surprisingly little opposition to the devaluation of the currency. Hawtrey, Rogers and Cunningham find that the devaluation in England was generally just sufficient to overcome the rise in the value of silver. Cunningham writes: "Prices remained fairly stable because the value of silver was slowly rising so that the practical effect of diminishing the size of coins was to prevent the fall in nominal prices which must otherwise have occurred." And Thorold Rogers says: "It is remarkable, that notwithstanding these successive diminutions, no effect is traceable in the prices of commodities, and no discontent is expressed at the action of the Crown." The situation was somewhat as follows: prices and wages were fixed by custom to such an extent that it was easier to change the silver content of a unit of money than the prices of goods and services. Hawtrey says: "There was nothing dishonest about the debasements which were effected to keep money in the country; and in medieval conditions, with wages and prices to a great extent stereotyped, such debasements were by no means invariably ill-judged."¹⁰ The question has been frequently asked why the large debasements did not result in an inflationary rise in prices in England. According to Ricardo, the reason was that the government did not permit the devaluation to give rise to a corresponding increase in the quantity of money. "In the history of the British coinage we find, accordingly, that the currency was never depreciated in the same proportion that it was debased; the reason of which was, that it never was

its color and characteristics to the coin. This form of debasement was carried to extremes in England during the reigns of Henry VIII and Edward VI, in the years from 1543 to 1551.

¹⁰ W. Cunningham, *Growth of English Industry and Commerce*, I, 327, n.; J. H. T. Rogers, *Six Centuries of Work and Wages*, p. 341; R. G. Hawtrey, *Currency and Credit*, p. 278.

increased in quantity in proportion to its diminished intrinsic value." ¹¹

In the United States the fine silver content of the standard dollar has never been changed, altho the free coinage of silver was suspended in 1873. The gold content of the dollar has been changed on several occasions. From 1792 to 1834, the fine gold content of the dollar was 24.75 grains. This was excessive, relative to the silver content of the silver dollar, so that gold was not commonly brought to the mint for coinage, and what little gold was coined was generally exported. In 1834 the content of the dollar was reduced to 23.2 grains of fine gold in order to make the mint ratio of the value of gold to silver conform with the market ratio of their values. In 1837 the content of the dollar was increased to 23.22 grains of fine gold for the purpose of making uniform the proportion of fine metal in the gold and silver coins. From 1837 to 1933 the fine gold content of the dollar remained fixed at this weight, altho from 1862 to 1878 gold was not coined because the country was on an irredeemable paper standard. The Thomas amendment to the Agricultural Adjustment Act of 1933 gave the President the power, in his discretion, to reduce the fine gold content of the dollar by 50 per cent. Altho the dollar was not formally devalued under this authority, the Reconstruction Finance Corporation did purchase gold at prices considerably above the long established mint price of \$20.67 an ounce of fine gold. The Gold Reserve Act of 1934 made it mandatory for the President to reduce the fine gold content of the dollar by not less than 40 per cent nor more than 50 per cent. Under the authority of this act, the fine gold content of the dollar has

¹¹ D. Ricardo, *Principles of Political Economy*, chap. XXVII.

been reduced to slightly less than 60 per cent of its former content.

A devaluation of the currency of a country is not inflation, for it may be for the purpose of preventing a continued fall in prices and extremely severe deflation, and for the purpose of providing a means of inducing a rise in prices sufficient to restore economic equilibrium. The devaluation of the currency does not of itself bring about an automatic rise in prices. Unless the income and the expenditure of a community are increased, and this may require an increase in the quantity of money, the devaluation of the currency can have no effect on prices. Prices can be induced to rise only if the reduced gold content of the dollar provides sufficient banking reserves to become the basis for further creations of credit. If a policy of devaluation is to be successful, it must be followed by a reduction in the prevailing discount rate, or a rise in the proper discount rate, sufficient to bring about their equality, thus inducing an expansion of bank credit and a restoration of economic equilibrium. The dissociation of the dollar from a fixed weight of gold has given to the monetary authority of this country the power to manage the monetary system independently of movements in the value of gold. It is therefore not too much to expect that extremely severe deflations can hereafter be avoided.

Chapter XIV

Commercial Banks and the Price Level

1. Bank Credit, Prices and Production

It has already been stated that deposit money created by commercial banks, used in the form of checks drawn against demand deposits, is the largest part of the money supply of this country. In the United States, deposit money constitutes about 80 per cent of the total money supply, and because deposit money is used with greater frequency than lawful money, it is probable that more than 90 per cent of the business transactions of the community are paid for with deposit money. The community's holding of deposit money is dependent on the advantages of keeping its money resources in this form. Under given conditions, there is a proportion of deposit money to lawful money that is most convenient; and there will be a tendency for the community to adjust its holdings of money to this proportion. The convenient proportion of deposit money to lawful money varies from time to time; and it is higher during periods of prosperity than during periods of depression. One reason is that the rate of creation of deposit money falls off during depression. Another is that the community prefers lawful money at such times because of the doubt that its holdings of deposit money will be redeemed in lawful money on demand. This variation in the community's preference for lawful money relative to deposit money is at once the cause and the effect of banking difficulties. A change in the form of the community's hold-

ings of money does not affect prices, altho in fact, these changes go on simultaneously with changes in the value of money.

Variations in the quantity of deposit money are of great importance because they affect prices and production. In general, deposit money is created to meet the demands of business men for loans from banks. The borrowed money is paid to the factors of production to secure their services, and therefore it increases the income and the expenditure of the community. The larger expenditure brings about an increase in the quantity of goods sold and a rise in prices. How far an increase in the quantity of deposit money results in an increase in production, and how far in an increase in prices, depends upon business conditions at the time. If the factors of production are fully employed, the increased expenditure serves largely to raise prices; but if the factors of production are to some extent unemployed, the larger expenditure also increases production. A decrease in the quantity of deposit money because of the repayment of bank loans by business men, decreases the payments to the factors of production, and the income and the expenditure of the community. The effect on prices and production depends upon business conditions at the time. If business men are securing profits in excess of normal business earnings, the decrease in expenditure will largely affect prices; but if business men are securing only normal business earnings, the decrease in expenditure will largely affect production. Because bank loans are made primarily to finance investment, and because variations in prices and profits affect investment, changes in the quantity of deposit money alter the manner in which the resources of the community are utilized in producing consumption goods and investment goods.

The effect of variations in the quantity of deposit money on the production and utilization of the national income can best be seen from a concrete illustration. Assume a community in which one million persons working together produce 120 million units of real income (R) annually, and that for this production they are paid annual earnings of 120 million units of money (E). If the entire annual output were sold for money, and if money income were used solely for purchasing output, the price of one unit of output would be one unit of money, in accordance with the primary income-expenditure equation $P = \frac{E}{R}$. Under these con-

ditions, prices are precisely equal to expenses of production, so that business men receive their normal business earnings, and have neither profits nor losses. If production, and expenditure, including investment, go on at a regular rate, the price level will remain constant during the entire period—that is, a unit of output will sell for a unit of money.

Assume that to finance these transactions the community has a supply of 20 million units of money, of which 6 million units are reserved as a minimum balance by business men for business purposes, and 4 million units are reserved as a minimum balance by consumers for consumption purposes. It follows that the remaining 10 million units of money pass from business men to the factors of production in a period of time, say one month, and during the month these 10 million units of money flow back to business men in payment for the 10 million units of output produced and sold during the month. Under these conditions the average income per person is 10 units of money per month, and production and consumption, including investment, is 10 units of output per person per month. So long as no changes in income and ex-

penditure, and in production and consumption, take place, this equilibrium will be maintained.

Assume that the business men of the community borrow from the banks 2.5 million units of money which they expend in one month on the purchase of goods for investment. In this month the outlay of the community for consumption and investment is 12.5 million units of money, while the output remains 10 million units; and the average price of a unit of output during the month consequently rises to 1.25 units of money. At the higher price level consumers find that their real income has been diminished by 2 million units of output, while business men have increased their investment by the same amount.¹ To the extent that the diminished real income of consumers brings about a decrease in consumption, the community has been forced to save; and investment has been increased by the same amount. With the increased investment and with higher prices, business men receive profit from the production and sale of output. If the factors of production are not fully employed, one effect of increased investment will be to increase production; but if the factors of production are already fully employed, the effect of the increased investment will be to raise prices.

If the money rates of remuneration are not increased, business men continue to pay only 10 million units of money per month to the factors of production. The price level of 1.25 units of money per unit of output can be maintained only if

¹ It is assumed in this illustration that the expenditure of the community is on current output, and not on the output of a preceding period. It is also assumed that the factors of production can be applied to the production of investment goods instead of consumption goods without difficulty. To the extent that these assumptions are not true, the real income of the factors of production will be diminished somewhat less than the amount stated above. This is a particular application of the problem of the wages fund theory to the question of forced saving.

business men invest, or expend, their monthly profits of 2.5 million units of money. In general, while business men receive profits, and the community experiences inflation, investment is maintained. Eventually, the existence of business profits gives rise to higher money rates of remuneration for the factors of production, the consumers' outlay is increased, and when equilibrium has been restored, the factors of production again receive a real monthly income of 10 million units of output. This new equilibrium will be at a higher price level, with larger income and expenditure, and it will require larger cash balances than the community has had.

In the same manner, a repayment of bank loans by business men affects prices, profits and production, and the savings and investment of the community. Assume that the quantity of money is 22.5 million units, of which 6 million units are reserved by business men as a minimum balance for business purposes, and 4 million units are reserved by consumers as a minimum balance for consumption purposes. The remaining 12.5 million units of money are paid by business men to the factors of production at the beginning of every month, and during the month these 12.5 million units of money flow back to business men in payment for the 10 million units of output produced and sold during the month. Under these conditions, the average income and expenditure per person are 12.5 units of money per month; production and consumption, including investment, are 10 units of output per person per month; and the price of a unit of output is 1.25 units of money.

Assume now that the business men of the community repay 2.5 million units of money in bank loans in a given month. If this were withdrawn from the cash balances of business men, and the balances thereafter maintained at the

lower amount, no other adjustments would be necessary. Otherwise business men must upset economic equilibrium in order to repay their bank loans while maintaining their cash balances. In general, there are two ways in which business men secure the necessary funds: first, by increasing the quantity of goods they offer for sale by drawing upon their stocks; second, by decreasing their employment of and payments to the factors of production. Both methods involve a decrease in the volume of investment by business men. If the first is chosen, prices fall, losses are incurred, employment decreases, rates of remuneration fall, and eventually a new equilibrium is established with lower prices and lower money incomes. If the second is chosen, the ultimate effects are the same, except that employment and rates of remuneration fall first, and prices later. In practice, it is likely that both methods will be used: business men will decrease their employment of the factors of production, and will increase the quantity of goods offered for sale. Prices must then fall relative to the expenses of production, and the community experiences a deflation, with an eventual return to equilibrium when the necessary adjustments have been made in prices and expenses, and in saving and investment.

The creation of bank credit does not of itself increase the wealth of the community; nor does the repayment of bank loans of itself decrease the wealth of the community; but variations in the quantity of deposit money affect the production and the utilization of wealth, and are therefore of great importance to the community. "It remains true," says Professor Schumpeter, "... that no wealth can be created by banking operations. . . But those banking operations are an important device for bringing about a better arrangement of productive forces; and if saving there be it is not

the usual sort of saving, but what we may term forced saving." ² Conceivably, it is possible for the community to make adjustments that will offset changes in the creation or repayment of bank credit, so that equilibrium can be maintained; but this requires a flexibility in the economic system that does not exist. For this reason it is important that banking operations should be regulated in such a way that forces upsetting economic equilibrium are not induced by changes in the creation and repayment of bank credit; and that forces in the economic system upsetting equilibrium are neutralized by proper regulation of banking operations.

2. The Ratio of Reserves to Deposits

The commercial banks of the country are organized and managed primarily for the purpose of securing maximum profits, altho this may be a broad view, looking to the long run rather than the short run. No doubt, there is some feeling in the banking system that it holds a public trust, and that under certain conditions public welfare ought to take precedence over private profit in determining banking policy. This feeling is most marked in the management of such institutions as the Bank of England, the twelve Federal Reserve Banks, and other central banks, which consider themselves concerned primarily with the general interests of the nation, altho they may be privately owned and operated. But the view that banking is even largely a public trust and not a business for profit is almost entirely unknown among ordinary commercial banks. At best, there is a vague feeling that a policy maximizing banking profits is at the same time likely to be in the public interest.

Because banking is a business, banks hold assets for the

² J. A. Schumpeter, "The Explanation of the Business Cycle," *Economica*, 1927, p. 305.

purpose of securing profits, and in the selection of their assets they are guided by the power these assets have of increasing the net profits of the business. In banking, the income-earning assets are all interest, rent and profit paying claims that a bank owns—in general, its loans and investment. To carry on a banking business, other assets must be held which do not themselves directly give rise to income, but which are nevertheless essential for the convenient and economic conduct of affairs. In banks, the principal asset of this kind, absolutely essential for carrying on business but not itself a direct source of income, is the bank reserve. In fact, the policy of the banking system in creating credit is largely determined in relation to its available bank reserves. For this reason a study of banking operations and their regulation must begin with a consideration of bank reserves.

A reserve is sometimes required by law, and it is always essential for carrying on banking business. First, there are demands made daily for the redemption of deposits in lawful money. Normally, payments over the counter tend to equal the lawful money deposited during a period of time. But withdrawals may be concentrated in mornings, while deposits are made in afternoons; or withdrawals may be made on some days of the week, while deposits are made on other days. A bank must have sufficient reserves to take up such variations in the flow of lawful money. Second, settlement must be made with other banks whenever a negative balance is established at the clearing house. Normally, the claims against a bank tend to be offset by its claims on other banks; but there are times when the claims against a bank exceed its claims on other banks, and a reserve must be kept to settle such balances. Third, there are times when an unusual quantity of lawful money is required, and a bank must provide

for such emergencies. A sudden change in the attitude of the community may lead to heavy withdrawals or large negative balances at the clearing house. According to the expected nature and frequency of such emergencies, banks ought to keep reserves more than sufficient to meet ordinary withdrawals and clearing balances.

In a broad sense all the assets of a bank are reserves, for when needed they can be used to secure lawful money. But more particularly, banks regard as their reserves the lawful money held in their vaults and their deposits with the central bank or with other banks. In the United States, the member banks of the Federal Reserve system are required to keep 7, 10 or 13 per cent of their demand deposits with the Federal Reserve Bank of their district. Funds so kept are legal reserves. In addition, most banks keep funds with the Federal Reserve Bank, or with commercial banks in other centers, for use in settling clearing house balances—clearing funds. And banks keep a quantity of lawful money of all denominations for paying checks presented over the counter—vault cash. Clearing funds and vault cash, with their emergency allowance, constitute business reserves; and legal reserves and business reserves together constitute necessary reserves. The necessary reserves of a bank tend to be a constant proportion of its deposits; altho this proportion does vary in periods of deflation and inflation. The proportion of reserves to deposits may be called the reserve ratio; and the proportion of deposits to reserves may be called the deposit multiple; so that the reserve ratio and the deposit multiple are reciprocals of each other.

Whenever its reserve ratio is above normal, a bank is holding excess reserves. The policy of a bank in extending its holding of income-earning assets—loans and investments—is

determined with reference to its excess reserves, for they indicate that an opportunity for increasing profits is not being utilized. On the other hand, when the reserve ratio is below normal, the bank is holding insufficient reserves. Altho its profits may be large from holding income-earning assets, prudence requires that it convert part of its assets into funds available for reserves. The only method by which a bank can change the rate at which it is creating bank credit is by raising or lowering its requirements for lending, the discount rate being regarded as one requirement. If the discount rate is fixed by law or custom, so that it cannot be raised, it may be necessary for a bank to ration the supply of bank credit among its customers; and if the discount rate cannot be lowered, it will be difficult to find borrowers among its customers, and it may be necessary for a bank to lend its funds on the open market where customary rates do not prevail, or to purchase investments.

When a bank with excess reserves enlarges its holding of income-earning assets by extending loans to customers, or by purchasing investments, it tends to diminish its reserves. Whether it purchases investments and pays for them by check, or makes loans to customers who withdraw the funds by using checks, the bank finds its balance at the clearing house is negative; and in paying this negative balance its reserves are decreased. Each bank tends to increase its holdings of income-earning assets until it has utilized all of its reserves which it regards as excessive for the time being. In practice this means that a bank expands its loans and investments, and depletes its reserves, until the reserve ratio is normal—the necessary proportion of its deposits. It has been tacitly assumed that a bank is alone in increasing its income-earning assets. In fact, a variation in the reserves of a bank

depends largely upon the rate at which it increases its income-earning assets relative to the banking system as a whole. And a variation in the excess reserves of the banking system depends largely upon the rate at which it is increasing or decreasing loans and investments relative to the rate at which the central bank is increasing or decreasing the supply of lawful money and of reserve deposits.

3. *The Creation of Deposit Money*

The operations of the banking system in increasing or decreasing its holdings of income-earning assets affect the quantity of deposit money. This can be seen from a consideration of the nature and origin of deposits. A deposit in a bank that does not originate in a loan by that bank is a primary-deposit and increases the reserves of the bank. If the deposit decreases the reserves of another bank by the same amount, it is a transfer-primary-deposit. If the deposit is not offset by a decrease in the deposits and reserves of other banks, it is an additional-primary-deposit. It is characteristic of primary-deposits that they increase the reserves of the banks receiving them. A transfer-primary-deposit leaves the reserves of the banking system unchanged, while an additional-primary-deposit increases the reserves of the banking system. It is important to note that additional-primary-deposits can originate only from an import of gold, from the issue of lawful money, from the purchase of income-earning assets by the central bank, from the granting of reserve credit by the central bank, and from a conversion of lawful money into deposit money by the public. Under certain conditions the fiscal operations of the national government may also bring about an increase in additional-primary-deposits and in excess reserves.

A deposit created by a bank when it grants a loan in the form of a credit on its books is a loan-deposit. As already indicated, loan-deposits created by a bank give rise to transfer-primary-deposits in other banks when the borrowers use the loans. Some of the payments by borrowers from their loan-deposits will be made to other customers of the lending bank and give rise to derivative-deposits—that is, deposits that remain with the lending bank. To the extent that a loan-deposit gives rise to transfer-primary-deposits in other banks, it depletes the reserves of the lending bank, but it does not affect the total reserves of the banking system. Because a loan-deposit increases the total deposits of the banking system, and therefore the reserves needed by the banking system, it does decrease the excess reserves of the banking system. If sufficient loan-deposits were created by the banking system, the excess reserves could be eliminated entirely, altho the amount of reserves might not be decreased.

The effect of an additional-primary-deposit, or of excess reserves, is to increase the capacity of the banking system to hold income-earning assets, and to create deposits, by several times the additional, or excess, reserves. Assume that a customer of Bank B in a gold standard country deposits a quantity of gold that was imported from abroad. This is an additional-primary-deposit, and it increases the reserves of Bank B and of the entire banking system. The additional-primary-deposit upsets the normal ratio of lawful money to deposit money, so that a fraction of the deposit is withdrawn to increase the community's holding of lawful money, and the reserves of the banking system are diminished by that amount. Against the remainder of the deposit Bank B must retain a reserve. The excess reserve that results from an additional-primary-deposit therefore depends upon the com-

munity's need for more lawful money on hand, and the bank's need to maintain a reserve against the new deposit.

With excess reserves, Bank B extends its holding of income-earning assets, say, in the form of loans. Assume that it makes a loan to the full amount of its excess reserves to Customer C, and gives him a credit for this amount in the form of a loan-deposit. A part of this loan-deposit will be withdrawn in lawful money to maintain the ratio of lawful money to deposit money, and the remainder will be checked out by Customer C. A small part of this loan-deposit will be retained by Bank B thru derivative-deposits, but nearly the whole of the loan-deposit will become transfer-primary-deposits in other banks, and will increase the reserves of these other banks. The excess reserves of Bank B have been eliminated, but other banks have now acquired excess reserves to the amount of their transfer-primary-deposits less the necessary reserves on these deposits. Assume now that these banks with excess reserves also extend their income-earning assets by making loans, and creating loan-deposits. A part of these loan-deposits will be withdrawn in lawful money to maintain the ratio of lawful money to deposit money, and the remainder will be checked out by the borrowers. Thus the excess reserves of Bank B are spread throughout the banking system, and the original additional-primary-deposit gives rise to a series of loan-deposits. The total amount of the loan-deposits created by the banking system depends on the rate at which the excess reserves are depleted by two needs: first, for additional lawful money by the community; second, for reserves against loan-deposits created by the banks. In a similar manner a diminution of reserves brings about a multiple contraction of loans and investments and of deposit money.

Professor Angell and Professor Ficek have calculated the magnitude of the various factors affecting the expansion of deposits in the United States with a given volume of excess reserves. The capacity of an individual bank to increase its loan-deposits is shown by the equation

$$L = \frac{c}{r + (1 - r) \left(1 - \frac{s}{1 + b}\right)}, \text{ where}$$

L is the net loan-deposits that an individual bank can create;
 c is the lawful money and reserves available to meet the various needs—that is, the excess reserves;

r is the reserve ratio normal for the bank;

s is the relative size of the lending bank and the banking system; and

b is the ratio of lawful money to deposit money that the community normally requires.

If the lending bank secures no derivative-deposits, which are determined by its relative size, the loan-deposits it can create are precisely equal to its excess reserves. With a reserve ratio (r) of .10, and a ratio of lawful money to deposit money (b) of .09, the average American bank could create loan-deposits 1.00004 times its excess reserves, and the largest American banks could create loan-deposits 1.017 times their excess reserves.

The amount of loan-deposits that the banking system can create depends upon its excess reserves, and on the needs for lawful money by the community and for reserves by the banks. The capacity of the banking system to create loan-deposits is shown by the equation

$$L' = \frac{c}{b + r}, \text{ where}$$

L' is the total loan-deposits that the banking system can

create; and the other symbols are as defined above. With a reserve ratio for the banking system of .10, and a ratio of lawful money to deposit money of .09, the banking system can create loan-deposits to the extent of 5.26 times the excess reserves.³ In times of prosperity, when the ratio of lawful money to deposit money decreases, there may be no drain on reserves from this source; and the maximum amount of loan-deposits that the banking system can create becomes 10 times the excess reserves—that is, the deposit multiple.

It has long been a matter of controversy whether the banking system creates deposits. In part this controversy is the result of a difference in definition of terms, and in part of a failure to grasp the full effects of individual banking policy upon the condition of the banking system as a whole. The eminent banker, Mr. Walter Leaf, stated unequivocally that banks cannot create deposits: "The banks can lend no more than they can borrow [their deposits] . . . for the banks are strictly limited in their lending operations by the amount which the depositor thinks fit to leave with them."⁴ Certainly no bank can lend more than its excess reserves permit; but these excess reserves are used to create loan-deposits. Thus, if there were no further effects from bank loans it would still be true that banks create deposits. The further effects of bank loans are extremely important, for the loan-deposits of one bank give rise to transfer-primary-deposits throughout the banking system, and enable other banks to create loan-deposits. "While one bank receiving an addition to its cash cannot forthwith undertake a full multiple addition to its own deposits, yet the cumulative effect

³ J. W. Angell and K. F. Ficek, "The Expansion of Bank Credit," *Journal of Political Economy*, February and April, 1933.

⁴ W. Leaf, *Banking*, p. 102.

of the additional cash is to produce a full multiple addition to the deposits of all the banks as a whole.”⁵

These relationships can be summarized as follows: when the reserve ratio of a bank is normal, it cannot extend further loans until it increases its primary-deposits. An increase in primary-deposits enables a bank to create loan-deposits to the amount of the excess reserves, altho if it is a transfer-primary-deposit another bank may have to contract its loans if its reserves have been reduced below normal by the transfer of the deposit. An additional-primary-deposit increases the reserves of the banking system. It not only permits the receiving bank to create loan-deposits to the amount of the excess reserves, but by increasing the reserves of other banks to which the loan-deposits are transferred, it permits the banking system as a whole to create loan-deposits on the basis of the excess reserves to the maximum of the deposit multiple. In this sense banks create deposits by extending their loans and investments, altho the rate at which banks create deposits depends upon the reserves they acquire.

4. *The Regulation of Banking Operations*

It has been assumed that the banking system adjusts deposits to reserves up to that point where the normal deposit multiple is obtained. In England this is the only manner in which the reserve ratio can be controlled. The supply of bank reserves is determined by the lending and investment activities of the Bank of England, and the banking system must adjust its creation of loan-deposits to these reserves. It is not customary for English banks to pledge their assets; and they do nothing to induce the Bank of England to expand its loans and investments, other than to contract their

⁵ W. F. Crick, "The Genesis of Bank Deposits," *Economica*, 1927, p. 196.

own loans, and thus require their customers to seek accommodation at the Bank of England. In this country member banks may secure the optimum multiple of deposits to reserves not only by varying the creation of loan-deposits, but also by acquiring additional reserves by pledging or selling their assets to the Federal Reserve Banks. Thus, while in England the only means of restoring the normal reserve ratio is to adjust the creation of loan-deposits, in the United States the banks also rely upon their ability to vary reserves by borrowing from the Federal Reserve Banks. Altho the additional method of adjusting the reserve ratio in this country permits a more moderate rate of contraction of loans when it becomes necessary, it also permits a more extreme expansion of loans on the basis of borrowed reserves when it becomes profitable.

In practice the reserve ratio for banks is not fixed and invariable. In the period of active business, when the banking system is increasing its loans and investments, the reserve ratio tends to be somewhat smaller than normal, and conversely, during the period of business depression, the reserve ratio tends to be much greater than normal. If the legal reserve that must be kept with the central bank is an invariable percentage of the deposits, the reserve ratio tends to be somewhat rigid, altho there is always some elasticity. In Great Britain, Canada and in other countries where no legal reserve is required, the reserve ratio is quite elastic; and the variation in the reserve ratio during different phases of a business cycle may be relatively large. In all probability a rigid reserve requirement is disadvantageous, for it necessitates so prompt an adjustment of reserves to deposits that the banking system and individual banks are frequently compelled to engage in the contraction of deposits or in the

expansion of reserves at a rate that may be harmful to business and to the banking system. The management of reserve requirements should be an important part of a comprehensive program of monetary management.

The banking system induces changes in the price level by the rate at which it expands or contracts loan-deposits. The effects of an expansion or contraction of deposits are cumulative, for an expansion, by raising prices and profits, induces business-men to seek additional loans; while a contraction, by lowering prices and profits, induces business men to diminish their demand for loans. For this reason it tends to be true that prices rise because they have risen, and fall because they have fallen. The banking system can generally prevent a rise in prices and profits by raising its requirements for loans, the discount rate being regarded as one requirement; and by refusing to buy investments except at lower prices. But it is not always possible for the banking system to raise prices and profits by lowering its requirements for loans at a time when business is unprofitable. Undoubtedly lower requirements for loans induce marginal borrowers to increase their demand for loans; but to induce a large increase in borrowing it might be necessary to reduce the requirements for loans to an unprofitable level. Under such conditions, a rise in the price level can be brought about only by an increase in the equilibrium discount rate, and this requires the extension of the investment activities of government—a question that must be postponed for later consideration.

The banking system is organized for profit, and in the creation of credit it is guided by the desire to maximize profits. In a period of great business activity the banking system makes large profits—during a period of inflation, as

from 1914 to 1920, unusually large profits. But during a period of depression, the banking system finds its profits falling off to a very large extent, and the default on loans and investments and the fall in the value of banking assets may even bring about insolvency. There would seem to be little question that on the whole the abnormal profits of the boom period are inadequate compensation for the low profits and the great risks of the depression period. Schumpeter says that "the banking business itself would probably prosper more under stable conditions than it does in conditions in which the higher rate of interest and the lucrative deals of booms are constantly being offset by the slackness of business and by the losses in crises and depression." ⁶

Altho the banking system itself would profit by a moderation of fluctuations in the creation of credit, no individual bank can have sufficient interest in a restriction of credit during inflation, or an expansion of credit during deflation, to cause it to act counter to the prevailing banking policy. The individual bank that refuses to expand its loans and investments during inflation will find itself overloaded with non-income-earning assets, and its profits far below the level in competing banks. On the other hand, during deflation, when its own reserve position is strong, it will find no demand on the part of its customers for bank loans. Thus its policy, while having little effect on the volume of credit created in good and bad times, deprives it of the profit that can be made during periods of great business activity, and does not increase its profits correspondingly during periods of inactive business. There is, therefore, no advantage to an individual bank in attempting to act counter to the prevailing banking policy, even when this policy is

⁶ J. A. Schumpeter, "The Explanation of the Business Cycle," *Economica*, 1927, p. 306, n.

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The Chase National Bank of the City of New York

Statement of Condition, December 31, 1934

Assets

Cash and due from banks.....	\$ 514,731,533.55
U. S. government obligations, direct and fully guaranteed	503,434,803.19
State and municipal securities, maturing within two years.....	77,368,535.72
Other state and municipal securities.....	31,687,069.16
Other securities, maturing within two years..	20,452,396.52
Federal Reserve Bank stock.....	8,160,000.00
Other bonds and securities.....	93,531,587.92
Loans, discounts and bankers' acceptances....	651,069,766.03
Banking houses	39,930,029.80
Other real estate.....	1,640,384.50
Mortgages	4,055,281.74
Customers' acceptance liability	41,436,541.55
Other assets	11,552,917.63
	<u>\$1,999,050,847.31</u>

Liabilities

Capital—preferred	\$ 50,000,000.00
Capital—common	100,270,000.00
Surplus	50,000,000.00
Undivided profits	18,839,363.44
Reserve for contingencies.....	18,570,320.70
Reserve for taxes, interest, &c.....	1,216,435.32
Deposits	1,639,086,386.84
Certified and cashier's checks.....	70,705,988.03
Acceptances outstanding.....	43,836,819.86
Items in transit with branches.....	886,813.77
Liability as endorser on acceptances and foreign bills	408,055.15
Other liabilities	5,230,664.20
	<u>\$1,999,050,847.31</u>

Monetary Problems

Assets and Liabilities of Banks, June 30, 1934 *
(Millions of dollars)

Assets	National Banks	Other Banks**
Cash in vault.....	352	299
Reserve with Federal Reserve Banks or other banks.....	2,497	1,901
Due from banks.....	2,535	1,399
Checks in clearing and other cash items	312	308
Loans, discounts and overdrafts.....	7,698	7,698
United States government securities..	5,646	4,217
Other bonds, stocks and investments...	3,703	3,148
Banking houses and equipment.....	656	474
Other real estate.....	152	290
Other assets	351	611
Total Assets.....	23,902	20,345
Liabilities		
Capital stocks and capital notes.....	1,738	1,746
Surplus	854	1,238
Undivided profits, net.....	257	237
Reserves for contingencies.....	152	299
Demand deposits not otherwise classified	9,281	8,252
United States deposits, except postal savings	889	836
Due to banks and trust companies.....	2,684	1,683
Time deposits, including postal savings deposits	6,891	5,172
Certified and cashiers' checks, and other deposits	187	191
National bank circulation.....	698	...
Bills payable, rediscounts, and accrued expenses	58	196
Other liabilities	212	495
Total Liabilities.....	23,901	20,345

* Adapted from Comptroller of the Currency, *Annual Report for 1934*, pp. 94-96.

** Not including stock and mutual savings banks.

not in the public interest. But the central bank, by controlling the supply of bank reserves, can affect the volume of credit created by the banks, and since it is never motivated entirely by profit, its policy of control can be determined by considerations of public interest.

Chapter XV

The Central Bank and the Price Level

1. *The Functions of a Central Bank*

IN most countries the management of the monetary system is undertaken by the central bank. The supply of bank reserves, upon which the quantity of deposit money created by the banking system depends, is largely determined by the policy of the central bank in increasing and decreasing its holdings of income-earning assets. The central bank provides the lawful money that the community requires to supplement its deposit money; and the banking system relies on the central bank to supply sufficient lawful money to meet the demands of the public for the redemption of deposit money. In gold standard countries, the central bank also manages the reserve of gold or of gold exchange—whichever is the ultimate standard of the monetary system. Thru its control of bank reserves and of lawful money, and its management of the gold reserve, the central bank is ultimately responsible for the functioning of the monetary system; and its policies are influential in regulating the economic life of the country.

A large part of the reserves of the banking system is kept on deposit with the central bank, because of legal requirements and for convenience. Member banks draw on these reserves in making payments to each other. If the reserves of a member bank are insufficient, it borrows additional reserves from the central bank by rediscounting its com-

mercial paper or by pledging other assets. The willingness of member banks to make use of the rediscount facilities of the central bank is determined by their need for immediate reserves and by the opportunity for profitable use of additional reserves. If there is a great demand for bank credit by business men, and if the rediscount rate of the central bank is low, member banks will extend their loans and deplete their reserves, for they are assured that additional reserves can be secured on favorable terms. Under particularly advantageous conditions, member banks may borrow reserves for the express purpose of extending their income-earning assets—loans and investments. By varying the terms on which it is prepared to rediscount for member banks—that is, to supply bank reserves—the central bank can influence the volume of credit that the banking system advances to business men.

There is another important method by which the central bank can affect the reserves of member banks—by open market operations. When the central bank purchases securities—say, government bonds or acceptances—it increases the reserves of the banking system. If the securities are sold by business men and the proceeds are deposited with member banks, the free reserves of the banking system are increased by the amount of the central bank's purchases less the reserves that must be retained against these additional-primary-deposits. If the securities are sold by member banks, the free reserves of the banks are increased by the full amount of the central bank's purchases. Conversely, when the central bank sells securities, either to member banks or to business men, it decreases the reserves of the banking system. The open market operations of the central bank—its purchases and sales of securities—are as important as its rediscounting

operations in affecting the reserves of the banking system. There is this important difference between the two methods: the initiative in obtaining and repaying rediscounts is taken by member banks, but the central bank undertakes open market operations on its own initiative.

The community's supply of deposit money determines its need for lawful money. If the ratio of lawful money to deposit money is too large, the community can decrease the ratio by depositing lawful money with the banks. Member banks can also decrease the ratio by extending their loans and investments, and it may be noted that the deposit of lawful money by the public provides them with reserves for this purpose. On the other hand, if the ratio of lawful money to deposit money is too small, the community can increase the ratio by converting deposit money into lawful money. The solvency of member banks depends on their maintaining the convertibility of deposit money, and therefore on their holding sufficient lawful money to meet their needs. Member banks can obtain lawful money immediately by converting their deposited reserves at the central bank. However, this withdrawal of lawful money from the central bank depletes the reserves of the banking system, and makes it necessary for the banking system to secure additional reserves. Fundamentally, the community's demand for lawful money brings about a corresponding demand for additional reserves by member banks. This demand for lawful money and for additional reserves can be met only by the central bank.

In supplying bank reserves and lawful money, the central bank of a country is not always free to act in its own discretion. In gold standard countries, limitations are placed on the operations of central banks by the requirement of a gold

reserve against deposits with the central bank and against notes issued by the central bank. In the United States, no longer on the gold standard, the Federal Reserve Banks are required to maintain a reserve in gold certificates of 35 per cent on deposits and of 40 per cent on Federal Reserve notes. The operations of central banks are thus in part dependent upon holdings of gold. Altho emergency provisions generally authorize the suspension of gold reserve requirements under certain conditions, the limitations on central bank control are not thereby removed. At a time when it would seem desirable to increase the reserves of the banking system—say, during a depression—it may be impossible because of the inadequacy of the central bank's holding of gold. The suspension of the gold reserve requirement is not always a satisfactory remedy, for it may raise doubts as to the adequacy of the gold reserve and the convertibility of money, and it may lead to a flight from the currency that will make impossible the maintenance of the gold standard. Any limitation on the operations of the central bank diminishes its control of the monetary system, and makes monetary management for the purpose of maintaining economic equilibrium more difficult.

The importance of the obligation to maintain a gold reserve depends on the manner in which it affects the policy of the central bank in rediscount and in open market operations. If the central bank holds that the primary object of management must be the maintenance of parity of the value of money with gold or with foreign exchange, its operations will be directed to this end. Under such conditions, if member banks should require additional bank reserves and lawful money at a time when the gold reserve is low, they may find difficulty in obtaining the additional bank reserves; and con-

sequently, member banks would be compelled to decrease the quantity of deposit money in order to maintain a normal reserve ratio. Similarly, if the central bank should find its gold reserve too low, it would be required to take steps to replenish the reserve. This can be done only by inducing a fall in prices, and in profits, production and in the rates of remuneration. In this manner, management of the monetary system with reference to the gold reserve may upset economic equilibrium.

In recent times two other objects of central bank policy have been emphasized—the stabilization of prices, and the maintenance of economic equilibrium. It is widely believed that the operations of the central bank can be directed in such a way as to bring about relative stability in the price level, and to counteract any tendency toward inflation or deflation. In general, it is probable that these objects can be realized by appropriate management of the reserves of member banks to assure the proper rate of creation and repayment of bank credit.

2. The Means of Central Bank Control

The Federal Reserve Banks—the central banks of this country—have three important means of controlling the expansion and contraction of bank credit—persuasion, rediscounting and open market operations. These means are not always effective, nor equally effective under all conditions. The Federal Reserve Banks are in a position to affect banking and business policies by their influence among bankers and business men. The opinions of Federal Reserve officials are widely quoted in the press, and the business community is to some extent guided by these opinions. A statement that expansion of bank credit has been carried too far is likely to

induce business men to be less eager to make commitments requiring additional bank loans, and to make bankers less willing to increase their loans and investments. The direct relations of the Federal Reserve Banks with member banks and with business men are even more important as a means of shaping member banks' credit policy. The Federal Reserve Banks can bring their views to the attention of member banks in their ordinary dealings, and by suggestion and admonition influence the credit policy of these banks; and thru the leading business men who are members of the Federal Reserve Board and directors of the Federal Reserve Banks, the views of the authorities can be made known to industry.

The power of the Federal Reserve Banks to guide credit policy by persuasion has been increased tremendously by recent legislation. The Reserve Banks have customarily limited the borrowed reserves of member banks to a fair share of the rediscounting facilities of the system; and they have attempted to prevent the use of the facilities of the system for an expansion of credit for speculative purposes. The Banking Act of 1933 authorizes the Federal Reserve Board to prescribe regulations under which the rediscount facilities of the Federal Reserve system may be extended to member banks; and the Board is given authority to limit the loans of member banks on stock market collateral. After a warning, a member bank making use of the facilities of the Federal Reserve system to extend its loans for speculative purposes may be refused the privilege of rediscounting. The power thus given to the Federal Reserve Board and the Federal Reserve Banks to penalize member banks that do not comply with the credit policy of the Federal Reserve system makes this means of control a more important factor than

it has hitherto been. Nevertheless, it is not a completely effective means of control. Altho persuasion may be effective in preventing an inflationary expansion of credit, it cannot be effective in correcting a deflationary contraction of credit.

Until 1923 the rediscount operations of the Federal Reserve system were regarded as its most important means of control. The accepted theory was that a rise in the rediscount rate induces member banks to repay their borrowed reserves, and to contract their loans and investments; and conversely, that a fall in the rediscount rate induces member banks to borrow reserves, and to expand their loans and investments. Recently, there has been a disposition to question the effectiveness of rediscount operations as a means of controlling the volume of bank credit. There can be no question that variations in the rediscount rate have not been as effective in regulating bank credit as they were expected to be.

It is important to distinguish two aspects of the effectiveness of rediscount rates. It is now generally admitted that when there is no demand for bank credit because business is unprofitable, member banks cannot be induced to expand credit by providing borrowed reserves at low rates. It is still generally held, however, that a rise in the rediscount rate can prevent an expansion of credit on the basis of borrowed reserves. Whenever the rediscount rate is a penalty rate—that is, the cost of securing borrowed reserves is in excess of the income realized from their use—there is a tendency to restrict credit and to minimize indebtedness to the Reserve Banks. As the rediscount rate is seldom as high as the customary discount rate, it is frequently said that the rediscount rate cannot prevent an expansion of credit. It must be

recognized that there is some cost attached to making bank loans, and a rediscount rate below the discount rate may nevertheless be a penalty rate. Further, as banks use funds not only in discounting paper, but also in making call loans and in purchasing securities, a rediscount rate is effective whenever it is in excess of the rate on any loan or investment that a bank would rather not make than borrow an equal amount of reserves. There seems to be evidence that a rediscount rate of 4 per cent or above tends to be effective, under ordinary conditions, in minimizing an expansion of credit. There are times when an ordinarily effective rate becomes ineffective. Obviously, when call money rates and investment yields are high, a 4 per cent rediscount rate cannot be a penalty rate.

It is sometimes argued that because the banking system can expand loans to several times the amount of borrowed reserves, even a penalty rate cannot prevent an inflation of credit. This is a mistaken view of the situation. An individual bank can increase its loans and investments only to the amount of the borrowed reserves. When the rediscount rate is raised to approximately the rate charged by the member bank on its loans, it becomes unprofitable to borrow reserves for the purpose of making loans. If member banks were to act in concert, it would be profitable to borrow reserves for the purpose of expanding credit, for an increase in reserves thru rediscounting would give each bank the power to make loans of several times its borrowed reserves. Such a situation is unlikely to arise, for it would be unstable. Any bank could increase its profits simply by restricting its own rediscounts, and by depending on transfer-primary-deposits to provide reserves for increasing its loans. In fact, the situa-

tion is not likely to arise, for it would require a degree of combination that has not been attained in the American banking system.¹

It is occasionally said that altho an individual bank cannot extend its loans by more than the amount of the borrowed reserves, this may be profitable even at a penalty rate, for the cost of the higher rediscount rate can be spread over loans made on existing reserves. The argument is fallacious. If the discount rate can be increased on loans made on existing reserves at a time when new loans are made on borrowed reserves, it certainly would have been possible to raise the discount rate even if new loans were not extended. Borrowing reserves at a high rediscount rate cannot be profitable merely because rates on loans made on existing reserves can be raised at the same time. The test of profitability is solely on the loans made possible by borrowing reserves. Under one condition it is conceivable that member banks would find it profitable to borrow reserves at a penalty rate in order to expand loans. If it were customary to charge business men a discount rate not exceeding the rediscount rate of the central bank, it might be profitable for member banks to borrow reserves in order to induce the central bank to raise its rediscount rate, and thus to make possible a higher discount rate on member bank loans. Obviously, this condition does not exist in the United States.

¹ Even if it were possible for member banks to make loans to their customers at a rate below the rediscount rate because each bank is enabled, by concerted action, to increase its loans by several times the amount of its borrowed reserves, the Federal Reserve Banks could easily counteract this practice. They could offer securities for sale at a price that would make it profitable for business men to borrow from member banks to purchase securities. Thus, the reserves would be depleted as rapidly as they are augmented by borrowing; and member banks paying a higher rediscount rate than the discount rate they are paid would be losers on the transaction.

If member banks are well supplied with reserves, or if their reserves are increased by additional-primary-deposits from a source beyond the control of the central bank—say, by an import of gold from abroad—it becomes more difficult for the central bank to limit the creation of credit, since the supply of bank reserves has become independent of the facilities of the central bank for the time being. Under such conditions it is possible for the central bank to offset the reserves of member banks by selling securities. This requires the central bank to diminish its holding of income-earning assets in order to bring about a corresponding diminution in the reserves of member banks. If the increase in additional-primary-deposits from outside sources is very large, and if the assets of the central bank are limited in amount, it may be impossible to offset the increase in bank reserves and to prevent an expansion of credit. It should be noted, however, that a large increase in additional-primary-deposits from outside sources cannot occur in countries not on a gold standard.

The open market operations of the Federal Reserve Banks consist of purchases and sales of government obligations and bankers' acceptances, altho other types of security are occasionally bought and sold. Since 1923, the open market operations of the Federal Reserve Banks have come to be regarded as their most important means of control. The control of open market operations of the Federal Reserve Banks is now vested in an Open Market Committee, consisting of one member from each Federal Reserve Bank, which must meet at least once each quarter in Washington. No Federal Reserve Bank may engage in open market operations except in accordance with the regulations adopted by the Federal Reserve Board; and if any Federal Reserve Bank decides not to participate in open market operations recom-

mended by the Federal Reserve Board, it must so notify the Open Market Committee.

At a time when member banks are not dependent upon reserves provided by the Federal Reserve Banks, the volume of credit can be controlled only by the sale of securities by the Federal Reserve Banks. If such open market operations are conducted on a large scale, the reserves of member banks can be reduced enough to compel them either to seek additional reserves by rediscounting, or to restrict their creation of credit. The Reserve Banks in this way can make effective the prevailing rediscount rate, and at the same time enforce their policy of credit contraction on the borrowing banks. The superiority of open market operations over rediscounting operations as a means of control is that the initiative can be taken by the Federal Reserve system in bringing about a desirable change in credit conditions.

Open market operations of the Federal Reserve Banks are less effective in bringing about an expansion of credit during deflation than a contraction of credit during inflation. Just as a low rediscount rate cannot induce member banks to borrow reserves when there is no demand for bank loans by business men, so the purchase of securities on the open market, altho providing additional bank reserves, may be ineffective in bringing about an expansion of bank credit. If member banks are indebted to the Federal Reserve Banks, purchases of securities on the open market tend to result in a repayment of borrowed reserves. If member banks are not indebted to the Federal Reserve Banks, open market purchases provide excess reserves without giving rise to an expansion of bank credit. In a sense, open market purchases of securities may be regarded as a special means of providing additional reserves to member banks without cost, except

insofar as the securities purchased by the Federal Reserve Banks are sold by member banks.

The great problem of credit control is to induce an increase in the volume of bank loans during a period of deflation. Altho this cannot be done directly by providing additional reserves at a low rediscount rate, it may possibly be done indirectly thru open market operations. The purchase of securities on a large scale tends to decrease the long period interest rate and thus to induce a rise in the price level of investment goods, and a demand for bank loans for the purpose of producing such goods. To be noticeably effective, such open market operations would have to be on a far larger scale than the purchases the Federal Reserve Banks have hitherto made. But even this indirect means of controlling the demand for bank credit may be ineffective. Under such conditions the only effective means of inducing a rise in prices, and a subsequent increase in the demand for bank loans, is thru direct investment. This means of controlling the price level and the volume of bank credit is not suited for use by the central bank, and it should probably be undertaken by government, the central bank providing the reserves necessary for the credit expansion that must accompany government investment.

3. Federal Reserve Policies

The Federal Reserve system has been in operation since 1914, a very short time in which to develop comprehensive policies of credit control and effective means of realizing them. From 1914 to 1917, the Federal Reserve system was entirely occupied with problems of organization. A complex system of graduated rediscount rates, with preference to some types of paper, was used for a time, but eventually

discontinued. The conditions during the early years of the Federal Reserve system were not favorable for successful attainment of the objectives now regarded as of primary importance—the stabilization of prices and the maintenance of economic equilibrium. The huge imports of gold from belligerent countries and the reduction in reserve requirements under the Federal Reserve Act increased the excess reserves of the banking system far beyond the power of the Federal Reserve Banks to offset the additional free reserves and to prevent inflation. The result was a rapid rise in prices—more than 70 per cent within two years. Under any circumstances, it is questionable whether prices could have been stabilized during these years so long as imports of gold provided reserves for the expansion of credit.

From 1917 to 1920, the operations of the Federal Reserve system were directed particularly toward facilitating government financing of the war. The rediscount rate was maintained at a relatively low level, and member banks were induced to hold government bonds and to extend credit to their customers for the same purpose. The financial needs of government continued to dominate Federal Reserve policy until 1920. A rise in the price level was therefore inevitable—nearly 50 per cent from the time the country entered the war in 1917 to the peak of inflation three years later. Some attempt to minimize the rise in prices was made in 1919. The rediscount rate was increased, and member banks were warned to limit their expansion of credit, and to prevent the use of their facilities for speculative purposes. It is worthy of note that the price level rose less rapidly in the three war and post-war years than in the two preceding years.

The attitude of Federal Reserve officials after 1919 was that the price level was artificially high, and that a fall in

prices was necessary to establish normal business conditions. For this reason a high rediscount rate was maintained during 1919 and 1920, and the volume of securities held by the Reserve Banks was decreased sharply. No effort was evidently made to prevent the tremendous deflation of 1920 and 1921; and the price level fell by 44 per cent in little more than a year. The recovery in business and in prices in 1922 was largely due to another large inflow of gold. Thus, altho the total credit made available by the Federal Reserve Banks was decreased by more than \$1,000 million from 1920 to 1924, the reserves of member banks increased in the same period. A noteworthy feature of Federal Reserve policy after 1923 is the recognition of the importance of open market operations. Thus in 1924, the Federal Reserve Banks made large purchases on the open market, providing the reserves necessary for an expansion of bank credit after the recession of that year. With recovery, the holdings were reduced, and rediscounts increased; altho the total volume of reserve credit remained nearly constant. The entire period from 1921 to 1927, particularly after 1923, was one of relatively small fluctuation in prices. The policy in these years was evidently to minimize price fluctuation, and in this the Federal Reserve Banks were successful, aided as they were by favorable circumstances.

To counteract a tendency toward deflation and falling prices in 1927, the rediscount rate was reduced and large open market purchases were made. There was a great increase in the volume of reserve credit between 1927 and 1929, particularly in the form of rediscounts for member banks. The liberal reserve credit policy of 1927 to 1929 was pursued partly for the purpose of offsetting the decrease in member bank reserves brought on by the great export of gold in 1927 and 1928, and partly for the purpose of aiding

Great Britain in maintaining stability of sterling exchange. Toward the end, the policy was in a large degree paradoxical, for its object was to have easy credit conditions while avoiding an expansion of member bank credit. The Federal Reserve Banks attempted to dissuade member banks from extending their loans on collateral, and they emphasized this policy by raising the rediscount rate. The total volume of reserve credit and the amount of rediscounts were reduced to a slight extent in 1929. Nevertheless, the reserves of member banks were not decreased, for the large imports of gold to take advantage of high call money rates in the New York market more than offset the reserves withdrawn by Federal Reserve operations. In order to halt the great extension of credit for speculation in stock market securities, the rediscount rate was again increased. In 1929, a recession in business and in prices and a collapse of the stock market preceded the most severe depression in American history.

The failure of the Federal Reserve system to halt the deflation is indicative of the limitations of the usual central bank methods of control. In 1930, the rediscount rate of the Federal Reserve Bank of New York was reduced to the lowest level in its history. In 1931, however, the credit policy of the Federal Reserve Banks was unduly restrictive, probably because of a desire to protect the gold reserves. The volume of reserve credit was increased rapidly after 1932, but the decline in prices continued. A tremendous increase in open market purchases was begun in April, 1932, without halting the downward course of prices. This very large increase in reserve credit, however, was more than sufficient to offset the decrease in bank reserves resulting from the withdrawal of funds from the New York market by foreign banks. Altho the total reserves of member banks were larger than before, these reserves were probably not excessive con-

sidering the loss of confidence in the banking system. The operations of the Federal Reserve system were unsuccessful in bringing about an expansion of bank credit, for business men did not demand loans for production while business remained unprofitable. It seems evident that the Federal Reserve Banks are more capable of restricting the creation of credit during inflation—altho in this they are not always successful—than in stimulating the expansion of credit during deflation. For this reason a program of control by the Federal Reserve Banks should probably be primarily directed toward preventing a disequilibrium in the credit and price structure, without neglecting the methods available for correcting, in part at least, conditions of disequilibrium.

Federal Reserve Credit and the Rediscount Rate, 1921 to 1933*
(Millions of dollars)

Year	Total Reserve Bank Credit	United States Securities	Bills Discounted	Rediscount** Rate, N. Y.
1921	2,128	248	1,750	4.50 p.c.
1922	1,224	453	565	4.00
1923	1,211	173	768	4.50
1924	1,002	416	372	3.00
1925	1,212	352	511	3.50
1926	1,272	340	601	4.00
1927	1,188	422	456	3.50
1928	1,534	280	896	5.00
1929	1,488	224	971	4.50
1930	1,090	571	275	2.00
1931	1,289	673	335	3.50
1932	2,083	1,502	502	2.50
1933	2,424	2,075	247	2.00

* *Survey of Current Business*, Annual Supplement, 1932; February, 1933; February, 1934. Average amount of credit outstanding.

** Rate prevailing at the close of each year.

4. *Proposed Changes in the Federal Reserve System*

It cannot be said that the Federal Reserve Banks have been entirely successful in their management of the monetary system. Altho from 1923 to 1927, the Federal Reserve operations aided in stabilizing prices and in minimizing fluctuations in business activity, from 1927 to 1933 they failed completely in preventing an undesirable expansion of bank credit and in correcting the severe deflation that followed. To some extent the failure of the Federal Reserve Banks to make their policy effective was due to the large imports and exports of gold that counteracted the operations of the reserve system in varying the volume of reserve credit. With the departure of this country from the gold standard, this source of disturbance is partly removed. Aside from this, there are indications that the virtual independence of the twelve Federal Reserve Banks have hampered them in their management of the monetary system. On several occasions the policies of the Federal Reserve Banks have been conflicting—some expanding reserve credit while others were restricting reserve credit, at a time when it was not required by inter-district trade balances. It is possible that the greater integration of the Federal Reserve Banks, particularly the formation of the new Open Market Committee, and the increased powers given to the Federal Reserve Board will remedy this situation, altho it is desirable to extend these powers even farther.

The difficulty that the Federal Reserve Banks have hitherto experienced in preventing an excessive expansion of credit by member banks is in part remedied by the power to deny the facilities of the Federal Reserve system to member banks that have extended loans for speculative purposes. This should be supplemented by giving the Federal Reserve

Banks the power to refuse reserve credit to member banks that have expanded their loans excessively for any purpose. A less drastic means of preventing an excessive expansion of credit on borrowed reserves would be to apply progressively higher rediscount rates on all member bank indebtedness in excess of the basic line of credit. An amendment to the Federal Reserve Act in April, 1920, granted this power to the Federal Reserve Banks. This method of preventing excessive use of reserve credit was used by a few Reserve Banks, but it was not successful, partly because the deflationary period was not an opportune time to make use of this device. The right to impose progressive rediscount rates was repealed in 1923. The Federal Reserve Board should be authorized to permit Federal Reserve Banks to charge progressive rates on excessive borrowing when in its discretion such borrowing is undesirable. This method would probably have been effective in 1928 and in 1929 in preventing the large increase in member bank rediscounts and the resulting inflationary conditions.²

The most effective means of increasing control of the creation of credit would be to give the Federal Reserve Board authority to vary the legal reserve requirements of member banks. At present, member banks are required to keep from 7 to 13 per cent of their demand deposits on

² This should be supplemented with more frequent use of the right to require collateral in excess of the borrowed reserves. It is now customary for the Federal Reserve Banks to require member banks to deposit marginal collateral of 25 per cent whenever their borrowing from the Reserve system exceeds their capital and surplus. The same device could be applied to borrowing in excess of the basic line of credit. The marginal requirement could be made progressive; and this would deplete the capacity of borrowing banks to deposit eligible collateral. To give elasticity to the regulation, the Federal Reserve Banks should be permitted to require marginal collateral when in their discretion credit conditions make this desirable.

reserve with the Federal Reserve Bank of their district. This requirement is fixed by law and does not vary with the desirability of expanding or contracting the volume of bank credit. An elastic reserve requirement would make it possible to decrease or increase the free reserves of the banking system without undertaking open market and rediscounting operations that cannot always be successful. The plan was first proposed by the Federal Reserve Board in 1917, but it met with opposition and was dropped. It has since been approved by Keynes; and the Macmillan Committee has recommended its use by the Bank of England.⁸ The Thomas amendment to the Agricultural Adjustment Act of 1933 gives this power to the Federal Reserve Board, acting with the approval of the President, during an emergency. The amendment states: "The Federal Reserve Board, upon the affirmative vote of not less than five of its members and with the approval of the President, may declare that an emergency exists by reason of credit expansion, and may by regulation during such emergency increase or decrease from time to time, in its own discretion, the reserve balances required to be maintained against either demand or time deposits." This power should not be restricted to an emergency, for there is no good reason why the Federal Reserve system should not have this additional means of control.

The most important change that is required in the Federal Reserve system is a change in the objective of its management. It must be recognized that the primary purpose of monetary management is the maintenance of economic equilibrium and the minimizing of price fluctuations. All the powers of the Federal Reserve system should be utilized for this end.

⁸ J. M. Keynes, *A Treatise on Money*, II, 260-261; Committee on Finance and Industry, *Report*, p. 159.

5. *The Central Bank and the Gold Standard*

If the freedom of action of the central bank is restricted by the requirement of a reserve of gold against member bank reserves and against lawful money, and by the requirement to redeem lawful money in gold at a fixed rate, it becomes impossible to manage the monetary system to maintain economic equilibrium and to minimize fluctuations in prices. An attempt to maintain stability in the domestic price level at a time when the price level of other countries is falling inevitably results in an export of gold. If the central bank has no free gold—excess reserves—it must induce a contraction of the supply of member bank reserves and of lawful money. The effect of this on the volume of bank credit is shown by the equation

$$D = \frac{G}{R(b+r)}, \text{ where}$$

D is the amount of bank credit—deposit money—that must be contracted;

G is the quantity of gold exported;

R is the reserve ratio maintained in gold against member bank reserves and lawful money issued by the central bank;

b is the ratio of lawful money to deposit money required by the people; and

r is the reserve ratio for member banks against their deposits.

In the United States, if the Federal Reserve Banks were required to redeem lawful money in gold, and if a quantity of gold were exported at a time when the Federal Reserve Banks had no free gold and the member banks had no free reserves, the contraction in bank credit would be more than 15 times the amount of gold exported, if R is assumed to be

Assets of Federal Reserve Banks December 31, 1934

(Thousands of dollars)

Gold certificates on hand and due from U. S. Treasury.....	5,124,347
Gold	
Redemption fund—Federal Reserve notes.....	19,060
Other cash	257,577
Total reserves.....	5,400,984
Redemption fund—Federal Reserve Bank notes.....	1,677
Bills discounted:	
For member banks.....	6,988
For intermediate credit banks.....	
For non-member banks, etc.....	74
Total bills discounted.....	7,062
Bills bought:	
Payable in dollars:	
Bought outright	112
Under resale agreement.....	
Payable in foreign currencies.....	5,501
Total bills bought.....	5,613
Industrial advances	14,301
United States Government securities:	
Bought outright	2,430,256
Under resale agreement.....	
Total United States government securities.....	2,430,256
Other Reserve Bank credit:	
Municipal warrants	
Due from foreign banks.....	805
Reserve Bank float (uncollected items in excess of deferred availability items).....	4,880
Total other Reserve Bank credit.....	5,685
Federal Reserve notes of other Reserve Banks.....	28,502
Uncollected items not included in float.....	455,252
Bank premises	49,161
All other assets.....	43,652
Total assets.....	8,442,145

Liabilities of Federal Reserve Banks, December 31, 1934 (Thousands of dollars)

Federal Reserve notes:

Held by other Federal Reserve Banks.....	28,502
Outside Federal Reserve Banks.....	3,192,605

Total Federal Reserve notes in circulation..... 3,221,107

Federal Reserve Bank note circulation—net.....	26,390
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Deposits:

Member bank—reserve account	4,095,946
United States Treasurer—general account.....	120,746
Foreign banks.....	19,394
Other deposits	169,264

Total deposits..... 4,405,350

Deferred availability items.....	455,252
Capital paid in.....	146,725
Surplus (sec. 7).....	144,893
Surplus (sec. 13b).....	8,069
Reserve for contingencies	30,816
All other liabilities	3,543

Total liabilities..... 8,442,145

Federal Reserve Note Statement

Notes issued to Federal Reserve Banks by Federal Reserve

Agents	3,520,365
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Collateral held by Agents as security for notes issued to Banks:

Gold certificates on hand and due from U. S. Treasury.....	3,316,200
Gold	
Eligible paper.....	5,487
United States government securities.....	241,400

Total collateral..... 3,563,087

Federal Reserve Bank Note Statement

Notes issued to Federal Reserve Banks (outstanding).....	37,590
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Collateral pledged against outstanding notes:

Discounted and purchased bills.....	
United States government securities.....	42,874

.35, *b* .09, and *r* .10.⁴ Obviously, the necessity of maintaining gold reserves under such conditions greatly restricts the central bank in its management of the monetary system.

A contraction of credit can be avoided if the central bank holds free reserves of gold. For this reason many suggestions have been made to increase the quantity of free gold available to central banks. These suggestions range from the moderate proposal to reduce the gold reserve requirements of central banks to the more extreme proposal to abolish gold reserve requirements completely. The Macmillan Committee recommended that the free gold of the Bank of England be increased by severing the relationship between the quantity of lawful money and gold reserves, and by requiring only a minimum reserve of gold that could be decreased temporarily by permission of the Treasury.⁵ This would undoubtedly increase the control of the central bank over the domestic price level and business conditions. For a time it would enable a central bank to maintain the price level of its country independent of the price level in other gold standard countries. Eventually, the requirement to redeem lawful money in gold at a fixed rate would exhaust the gold reserves of the central bank if it continued to maintain the domestic price level above the price level in other gold standard countries. Restrictive regulation of international trade and international finance could prevent this; but if international business relations must be upset to maintain the gold standard, it is obviously useless to retain the gold standard because of its convenience in international trade.

Many economists have suggested that altho no one country

⁴ J. W. Angell and K. F. Ficek, "The Expansion of Bank Credit," *Journal of Political Economy*, February and April, 1933. Cf. the testimony of Dr. A. E. Goldenweiser, *Stabilization Hearings*, 1929, p. 26.

⁵ Committee on Finance and Industry, *Report*, p. 142.

can manage its monetary system to maintain stable prices under a gold standard, it would be possible for the central banks of the most important countries to coöperate to manage the value of gold and to maintain stability in the price level. Within broad limits, and for a comparatively short time, this could be done. But gold is a commodity; and ultimately its value must be determined by its cost of production relative to the cost of producing other goods and services. A higher value—lower prices—could be maintained only at the expense of keeping large quantities of unused gold; and a lower value—higher prices—could be maintained only by subsidizing the production of gold. It is very questionable whether successful management of the value of gold can be attained in the near future. Even if the value of gold could be maintained fairly constant in all countries—which is impossible—this would not of itself prevent fluctuations in business activity. To prevent disequilibrium in the economic system, the central bank must initiate changes in bank credit, in the volume of savings and investment, to offset non-monetary causes of disturbance. This can be done most successfully if the central bank is relieved of the obligation of converting lawful money into gold at a fixed rate; and if it is left free to manage the monetary system to maintain economic equilibrium and to minimize fluctuations in the price level.

Chapter XVI

Business Cycles

1. *The Phases of a Business Cycle*

It is characteristic of business activity that it is always changing. In part this is a manifestation of the normal growth of the population and wealth of the community, and in part of the adjustment of production to the seasons of the year. There are other variations in business activity of a recurring nature that are generally known as business cycles. The outstanding characteristic of business cycles is the great variation in the production and in the utilization of the national income. The variation in the volume of production is not uniform in all industries, but seems to be particularly great in the industries producing capital goods. The production of consumers' goods does not vary greatly, except during unusual prosperity, or during severe depressions when the growth in production is temporarily halted and production fails to attain normal capacity. The volume of investment is the most variable part of national expenditure, rising to great heights and falling to great depths during movements in business activity. The chief problem of business cycle theory is therefore to account for the variation in the production of and investment in capital goods.

The nature of cyclical changes in business activity is indicated by the phases of a typical business cycle. The period when industrial activity is below the normal level and is decreasing is the period of depression. It is marked by a fall-

ing volume of production, particularly of capital goods; and by a large amount of unemployment among the factors of production. Prices of commodities fall relative to their expenses of production, and business men secure less than a normal return. The unprofitability of business is indicated by the number of bankruptcies and industrial reorganizations; by the decrease in the demand for bank loans to finance production, and by a rapid decrease in the volume of investment.

The period when industrial activity is still below the normal level but is increasing is the period of revival. It is marked by an increase in the volume of production, particularly of capital goods, altho it is still relatively low. Prices of commodities rise relative to their expenses of production, but business men still do not secure a normal return. There is, however, some increase in the demand for bank loans to finance production, and the volume of investment, altho still relatively low, begins to increase. There is more employment of the factors of production, altho they are not fully employed.

It is possible to consider the depression and revival phases of a business cycle as the period of business deflation. Its characteristics are underemployment of the factors of production, a relatively small volume of output, prices low relative to expenses of production, the income of business men below their normal earnings, and a relatively small volume of bank credit and investment. The rates of remuneration of the factors of production tend to be high relative to prices during business deflation.

The period when industrial activity is above the normal level and is increasing, is the period of prosperity. The volume of production, particularly of capital goods, is large

and approaches the maximum capacity. Prices are high relative to expenses of production and are rising, so that business men secure large profits and expect even larger profits. The consequence is an increase in the employment of the factors of production, an increase in the demand for bank loans, and a high level of investment.

When prices begin to fall relative to expenses of production, and business profits decrease altho they are not entirely eliminated, the period is one of recession. The volume of production, particularly of capital goods, decreases altho it is still relatively high; employment is not so intensive, altho there is still little unemployment. The demand for bank loans does not decrease in the early period of recession. Later there is a fall in the volume of bank loans, and investment decreases rapidly.

The prosperity and recession phases of a business cycle may be considered the period of business inflation. Its characteristics are full and intensive employment of the factors of production, a relatively large volume of output, prices high relative to expenses of production, excessive business profits, and a relatively large volume of bank credit and investment. The rates of remuneration of the factors of production tend to be low relative to prices during business inflation.

There is an occasional characteristic of the variation in business activity that is important, particularly because it has attracted a great deal of attention in the past—financial crises. At every stage of business activity with a given level of prices and production, there is a quantity of money convenient and necessary to finance the production and utilization of the national income. This quantity of money consists of an appropriate amount of deposit money and of lawful money. If the quantity of money and its relative proportions

are not in accord with the needs of the community, a crisis may develop. If, for instance, business men require additional deposit money to meet their obligations, and the banking system is not supplied with sufficient reserves to undertake an expansion of bank credit, there may be a commercial crisis. The remedy is for the central bank to supply additional reserves, and for member banks to extend loans liberally to sound borrowers on appropriate terms. Similarly, if the community suddenly prefers a larger proportion of its balances in the form of lawful money, and demands the conversion of deposit money on a large scale, member banks may find themselves unable to meet their obligations, and there may be a banking crisis. At such a time the remedy is for the central bank to supply an adequate quantity of lawful money to solvent banks. Financial crises can occur in several phases of a business cycle, altho commercial crises are generally associated with extreme booms, and banking crises with extreme depressions.

2. The Duration and Intensity of Business Cycles

There is great variation in the intensity and duration of business cycles and their component phases. Some cycles are exceedingly mild, so that the variation in business activity escapes general notice; and there are periods of great variation in business activity, so striking as to attract general attention. During the depression of 1924, industrial production at its lowest point was approximately 16 per cent below the average for the three years from 1923 to 1925. On the other hand, in 1933, industrial production at its lowest point was approximately 50 per cent below the average output for 1929. Similar differences can be seen during periods of prosperity, altho the variations are less striking than during

periods of depression. The output in the month of greatest industrial activity during the moderately prosperous year 1926 was 11 per cent above the average for the three years from 1923 to 1925. In May, 1929, the month of greatest production in American history, industrial output was only 17 per cent above the average for the two years from July, 1926 to June, 1928. The differences in output during periods of prosperity are obviously much smaller than during periods of depression. This is to be expected, since the available supply of the factors of production sets an upper limit to the physical volume of production, altho there is no lower limit short of a complete stoppage of production.¹

There have been great differences in estimates of the length of a typical business cycle. In the last century, the prevalent view was that business cycles were ten to eleven years in length. In the early part of this century, the common view was that a typical business cycle was seven to eight years in length. More recently, the accepted view in this country is that business cycles are irregular in length, altho the average period for American cycles is generally regarded as three to four years. It is difficult to reconcile these varying estimates of the length of a typical business cycle. In part the differences may be accounted for by the varying duration of cycles in different countries. The recent estimates of a shorter cyclical period may reflect a tendency for cycles to be shorter. It may also be due to miscalculation of the average duration of a business cycle in earlier years, either because economists measured the period between commercial crises, or because they measured only the larger variations in business activity. This suggests the possibility that there are recurring periods of more and less intense cycles,

¹ Cf. W. M. Persons, *Forecasting Business Cycles*, chap. II, "Is There a Bed-rock to Curtailment?"

the long intense cycles of ten years consisting of three short mild cycles of forty months, altho the evidence on this point is not convincing.

The length of business cycles in the United States seems definitely shorter than in other countries. The studies of Professor Thorp show that in the 64 years from 1796 to 1860, there were sixteen cycles in this country, an average of precisely four years to a cycle. In the 63 years from 1860 to 1923, there were also sixteen cycles, an average of not quite four years to a cycle. From 1900 to 1923, the average length of business cycles in this country fell to approximately 3.4 years. In England, the average length of business cycles in the 63 years from 1857 to 1920 was precisely seven years. This indicates a marked difference in the duration of business cycles in these two countries. The irregular length of business cycles and the predominance of the three-year cycle in the United States is shown by the following table.²

Length of Business Cycles in the United States, 1796 to 1923*

Cycles of	Number	Cycles of	Number	Cycles of	Number
1 year.....	1	4 years.....	5	7 years.....	1
2 years.....	4	5 years.....	6	8 years.....	0
3 years.....	10	6 years.....	4	9 years.....	1

* W. L. Thorp, *Business Annals*, p. 43.

There are also great differences in the length of the various phases of a business cycle. In general, the recession and revival phases of a business cycle are relatively short. The depression and prosperity phases are much longer, covering together more than three-fourths of a typical business

² The statistical material in the rest of this section is taken from W. L. Thorp, *Business Annals*.

cycle. The length of depression is more variable than the length of prosperity, just as the intensity of depression is more variable than the intensity of prosperity. The longest depression in recent times lasted 100 months in Italy, ending with the revival of 1897. England has on two occasions had unusually long depressions, one of 69 months ending with the revival of 1880, and another of 68 months, ending with the revival of 1843. The depression in the United States ending with the revival of 1878 lasted 57 months. The depression that began in December, 1929, by far the most intense in American history, has already (March, 1935) exceeded 63 months. The longest depressions are invariably the most intense.

The longest period of prosperity in recent times lasted 72 months in France, ending with the recession of 1847. In England, the longest period of prosperity was 48 months, ending with the recession of 1900; and another lasted 44 months, ending with the recession of 1847. The longest period of prosperity in the United States was 42 months, ending with the recession of 1882. The long and intense business cycles seem to be international in character, while the short and mild cycles seem to be confined to individual countries. The differences in the length of business cycles are largely due to variations in the length of depressions. This indicates that the abnormality of prosperity may tend to correct itself, while the disequilibrium of depression may tend to be cumulative.

Statistical analyses of business cycles show clearly that there is no such thing as a normal business cycle. All cycles differ in intensity and in length, and in the intensity and length of their phases. This is largely due to the variety of forces affecting business activity. At all times, forces of an inflationary and deflationary character are present and active

in determining business conditions. If the inflationary forces predominate, there is a rise in prices relative to expenses of production, and a consequent increase in business activity. If the deflationary forces predominate, there is a fall in prices relative to expenses of production, and a consequent decrease in business activity. These forces may offset each other and prevent a large variation in production. Thus a good or a bad harvest may prevent a business deflation or inflation that would otherwise occur. When many inflationary or deflationary forces concur, and are not offset by opposite forces, the intensity of business cycles tends to be greatest.

3. *Theories of Business Cycles*

The theories of the cause of cyclical variations in business activity are exceedingly numerous. The earliest views were that the outstanding characteristic of business cycles of the time—the commercial crisis—was caused by independent phenomena, not themselves regularly recurring, such as wars, bad harvests, the failure of an important firm, and similar isolated events. Later views emphasized the uniformity in the movement of business activity, and sought the explanation in a regularly recurring cause, such as variations in weather, rainfall, the sun's heat and similar natural phenomena. The prevailing view at present is that the basic causes of business cycles are similar, altho each cycle has peculiarities of its own, intensifying or mitigating the severity of its phases. For convenience, theories of the causes of business cycles can be classified according to their emphasis on monetary and non-monetary factors, altho most theories recognize the importance of other forces.

One of the earliest explanations of business cycles is that they are caused by over-production. It is argued that the

capacity of society to produce goods tends to exceed its capacity to consume goods, and consequently there must be a halt in production and some unemployment at frequent intervals. Popular discussions of depression generally assume this theory, and the suggested remedies are intended to reduce the volume of production—by forbidding or minimizing the use of machinery, by a large and general reduction in the hours of work, and similar proposals. This elementary theory of over-production has few advocates among economists. It is not likely that the volume of production at any time in the past or present has been so large that society could not consume it all. Conceivably, a time may come when productivity will be so great that the community will prefer a much shorter working day than now prevails; but it is highly questionable whether this is the situation at present. A depression is not evidence that the production of goods is in excess of the needs of the community; but that the volume of goods that can be produced at prevailing expenses of production with the available factors of production cannot be sold at a profit at prevailing prices. The problem is why prices are low relative to expenses; and this is not explained by stating that the volume of production is excessively large.³

A theory that has had many advocates, and that is still widely held, is that variations in business activity are due to natural phenomena affecting crops. In 1801, the astronomer Sir William Herschel suggested that changes in sun spots may affect weather, crops and prices. Jevons, working

³ Similar objection can be made to the elementary under-consumption theory. Marshall wrote: "It is true that in times of depression the disorganization of consumption is a contributory cause to the continuance of the disorganization of credit and of production. But a remedy for it is not to be got by a study of consumption, as has been alleged by some hasty writers." *Principles*, p. 711, n.

on this theory, correlated the movement of prices in England with variations in the sun's heat. The sun spot cycle of ten to eleven years fitted fairly well with the tendency for commercial crises to recur during the half century prior to Jevons' study—there were crises in 1825, 1836, 1847, 1857 and 1866. More recently Professor H. L. Moore has found a tendency for crops to vary with cycles of rainfall at a critical period of the year. The eight-year cycle of rainfall he attributes to changes in the position of the planet Venus relative to the sun and the earth. He believes that the peculiarities of the rotation and revolution of Venus give rise to meteorological storms that are transmitted to the earth, and affect weather and crops. The variation in crops affects prices and the expenses of production in all industries using agricultural raw materials. If prices of industrial goods have some rigidity and other expenses do not vary sufficiently to offset the rise in prices of agricultural raw materials, profits must decline and production fall off. It is well established that there are cycles in the production of crops. How far these cycles affect industrial production is open to question; but it is extremely doubtful whether these cycles are of themselves a sufficient cause for large variations in the production of industrial goods.⁴

Many economists—including Bagehot, Jevons, Marshall, Taussig, Pigou and others—find the cause of cyclical variations in business activity in corresponding changes in business confidence. "The whole mechanism of society rests on confidence," wrote Marshall. "When confidence is shaken by a rumour of war or of civil commotion, or of disturbing financial legislation, or of extensive frauds or rash trading by important firms, then business life is stifled."⁵ In a society in

⁴ H. L. Moore, *Generating Business Cycles*.

⁵ A. Marshall, *Industry and Trade*, p. 165. Cf. F. W. Taussig, *Principles of Economics*, I, 393-394.

which highly specialized production is undertaken for profit, and is financed by funds borrowed from banks, the maintenance of confidence is essential if the orderly course of production and employment is not to be interrupted. In such a society the forces that may bring about a change in the confidence of business men are particularly numerous; and the inter-relations of producers transmit the effects of these forces from one to another until they are felt throughout the business community.

If for some reason business men believe that production will become more profitable, they will expand their output. This optimism may be justified, but as it spreads and grows it gives rise to an optimism and an expansion of output that is not warranted by business conditions. This is particularly true in industries where production is undertaken for a market distant in time or place. Nevertheless, for a time the expectations will be fulfilled if the business world acts upon them. Eventually this increased output is placed on the market, and business men find that their products do not have the value they expected.⁶ This in itself warrants a restriction of production; but in reaction to their previous error of optimism business men are likely to go to the other extreme and bring about an unjustified restriction of output. "The extent of the revulsion towards pessimistic error, which follows when optimistic error is disclosed, depends, in part, upon the magnitude of the preceding optimistic error."⁷ Thus errors of optimism give rise to errors of pessimism, and because they are contagious they persist and are not easily corrected. While errors of optimism and pessimism

⁶ Cf. E. Bohm-Bawerk, *Capital and Interest*, p. 135. "Crises . . . have no other cause than that quantities of products, in the manufacture of which no rule of art was omitted, cannot find the value expected."

⁷ A. C. Pigou, *Industrial Fluctuations*, p. 94. Cf. D. H. Robertson, *Banking Policy and the Price Level*, chaps. II and IV.

are undoubtedly made by business men, and these errors affect production, there is need to explain why business men persist in making such errors repeatedly and recurrently.

An important theory of business cycles that has gained many adherents in recent times is that variations in business activity are caused by periodic over-saving. The theory is that under given economic conditions there is one division of the national income between consumption and saving that will maintain industrial equilibrium. Similarly, there is one distribution of the national income among the factors of production that will bring about the proper division between consumption and saving. If the share of the laboring class in the national income is too small, there is a tendency for consumption to fall off and for saving to be excessive. This is because the owning and managing classes—the capitalists, landlords and business men—cannot or will not expend a sufficiently large part of their income on consumption. The consequence is over-saving, and, at first, a boom in the capital producing industries. As the new capital is used in producing consumption goods, the increased supply brings about a fall in the price level of such goods. With the decline in prices, production is restricted, employment is diminished and business is depressed. During depression, the income of the owning and managing classes is decreased, and a larger share of the national income is spent on consumption. As the disproportion between saving and consumption is corrected, production is resumed.⁸

⁸ J. A. Hobson, *The Industrial System*, chaps. III and XVIII. Compare what Karl Marx said: "The last cause of all real crises always remains the poverty and restricted consumption of the masses as compared to the tendency of capitalist production to develop the productive forces in such a way, that only the absolute power of consumption of the entire society would be their limit." *Capital*, vol. III, Part V, chap. XXX. Cf. what Joseph Harris wrote in his *Essay Upon Money and Coins* nearly two centuries ago. "For, where labour is very cheap, that is, where the labour-

There can be little doubt that under certain conditions a disproportionate volume of saving can lead to a disorganization of production. If the proportion of the real national income consisting of consumption goods is greater than the proportion of the money income devoted to purchasing such goods, there will be a tendency for the price level of consumption goods to fall; and this can be attributed to the disproportionately large volume of saving, or the disproportionately large volume of consumption goods. The fundamental question is whether a large volume of saving can bring about a disequilibrium in prices and production if the volume of consumption goods were adjusted to the money income that is expended on consumption. If the savings of the community were utilized entirely in buying capital goods, there could be no disequilibrium from this source. However, the savers do not themselves use their savings to purchase capital goods. Instead, they offer their savings to borrowers—business men—in return for an interest payment. If the interest rate that lenders require is too high to induce business men to borrow and use all the savings, disequilibrium will arise. It may then be said that disequilibrium is caused by over-saving, under-investment or under-consumption. Under any circumstances, the immediate cause is the excessive rate of interest for the savings available for loan and for use.

4. *The Monetary Theory of Business Cycles*

In recent times increasing emphasis has been placed on the importance of monetary forces in bringing about varia-

ers live very poorly, land will be also cheap; as the poor, from their numbers, are the principal consumers of the grosser products of the earth. . . . It seems then to be no good policy in the rich to deal too hardly with the poor." *Old and Scarce Tracts on Money*, edited with a preface by J. R. McCulloch, p. 353.

tions in business activity. It has already been indicated that prosperity is accompanied by prices that are high relative to expenses of production; and that depression is accompanied by prices that are low relative to expenses of production. Altho it is possible to have prosperity in periods of falling prices, and depression in periods of rising prices, it is undoubtedly true that the duration and intensity of business cycles and their phases are affected by long period price trends. "It seems inseparable from the existing organization of affairs that periods of highly stimulated production should alternate with periods of depression and restricted production. Under this universal and seemingly inevitable condition of commerce and industry," wrote Walker, "I cannot but believe that the general downward tendency of prices tends to make disturbances more frequent, to increase their severity, and, especially, to protract their duration."⁹ Statistical studies show that during periods of rising prices, the prosperity phase of business cycles is extended, and conversely during periods of falling prices, the depression phase is extended.

Prosperity and Depression During Rising and Falling Prices*

England	Yrs. of Prosperity per yr. of Depression	United States	Yrs. of Prosperity per yr. of Depression
1790-1815 rising prices..	1.0	1790-1815 rising prices..	2.6
1815-1849 falling " ..	.9	1815-1849 falling " ..	.8
1849-1873 rising " ..	3.3	1849-1865 rising " ..	2.9
1873-1896 falling " ..	.4	1865-1896 falling " ..	.9
1896-1920 rising " ..	2.7	1896-1920 rising " ..	3.1

* W. L. Thorp, *Business Annals*, p. 66.

⁹ F. A. Walker, *Discussions in Economics and Statistics*, p. 234. Cf. W. M. Persons, *Forecasting Business Cycles*, pp. 205-206.

The best known advocate of the monetary theory of business cycles is R. G. Hawtrey. He holds that "whatever other characteristics the trade cycle may have, it is, above all, a periodical fluctuation in productive activity and in the price level." And he adds that "the essential characteristic of the trade cycle is that maximum productive activity synchronizes with the maximum price level, and minimum productive activity with the minimum price level."¹⁰ The important point is to show how monetary factors affect prices and production.

Assume that for some reason, either because the interest rate is low, or the opportunities for profitable use of short-term capital are favorable, the demand for bank credit is increased. The expansion of bank credit and its use for production increase consumers' income and outlay, and prices and production are similarly increased. The rise in prices increases profits. So long as the rate of interest does not rise sufficiently to offset the greater profits, the demand for bank credit continues to expand. Eventually, the shortage of bank reserves, accentuated by the withdrawal of lawful money to provide the funds used by the working class, necessitates a contraction of credit. In gold standard countries, the drain on the gold reserves may be the cause of a contraction of credit to restrict the expenditure on imported goods and on foreign investments. The contraction of credit is made effective by raising the interest rate on short-term loans, altho other means are used to discourage borrowing. A high rate of interest impels merchants to restrict their orders to producers and to reduce their indebtedness by increasing their sales from existing stocks. Altho the effect on consumers' income and outlay is not immediate because pro-

¹⁰ R. G. Hawtrey, "The Monetary Theory of the Trade Cycle and Its Statistical Test," *Quarterly Journal of Economics*, 1927, pp. 472, 473.

duction already undertaken must be completed, there will be a fall in prices and production after a time. This induces a further restriction of output, a greater fall in prices and in profits, and a decreased demand for bank credit. Eventually, as bank reserves become excessive, the terms on which loans are made become favorable, and credit expansion begins again.¹¹

Most of the important monetary theories of business cycles find the cause of alternating periods of prosperity and depression in the rate of interest and its effect on credit, prices and production, and on the proportional production of consumption goods and capital goods. When the rate of interest in the capital market is too low to bring about an equilibrium between the supply of savings and the demand for capital, the banking system is called on to provide the deficiency. This tends to make the price level higher than it would otherwise be, for the additional bank credit affects prices and production, particularly of capital goods. Industrial stability requires an equality of the prevailing market rate of interest and the equilibrium rate of interest—that is, the rate that will equate the supply of savings and the demand for capital. A divergence of the market rate and the equilibrium rate of interest may be brought about by any forces affecting the supply of loan funds or the demand for capital. The supply of loan funds is determined by the savings of the community, and by the reserves of the banking system. The basis for disequilibrium exists in a banking system that determines its rate of interest with reference to its reserves, and not by the supply of savings.¹²

One of the most brilliant of recent theoretical analyses of business cycles is that of Keynes in his *Treatise on Money*.

¹¹ R. G. Hawtrey, *Currency and Credit*, chap. IX.

¹² F. A. Hayek, *Monetary Theory and the Trade Cycle*, chaps. III-IV.

He holds that disequilibrium can be brought about by monetary, industrial and investment factors. Assume a monetary disturbance caused by an increase in the quantity of money—say, by an import of gold. The reserves of the banking system are increased, and the terms on which bank credit is given are altered to restore the necessary ratio of bank reserves to bank liabilities. At the lower interest rate and with the greater reserves, the volume of bank credit is increased, because previously unsatisfied borrowers can be accommodated, because the lower interest rate increases the prices and production of capital goods, and because business men who foresee the ultimate effect on profits increase their demand for bank loans. The greater employment and production bring about an increased investment in working capital and in stocks of finished goods, and thus induce a further rise in prices. Eventually, a new equilibrium is established at a higher price level when the rates of remuneration of the factors of production are increased, and when further investment is halted by the difficulty of securing additional credit from the banking system.

Direct changes in investment are the most important type of disturbance, for while changes due to monetary or industrial factors tend to bring about a new equilibrium, an excess movement in investment in one direction tends to induce an excess movement in the other direction. Economic equilibrium requires an equality of saving and investment. As saving is relatively constant, disequilibrium generally arises from variations in the rate of investment. Any one of many factors may lead business men to increase investment—the stimulus being an opportunity for unusual profit. The increase in investment brings about a rise in prices. As soon as prices rise relative to expenses, there is a further inducement to continue investment. There are thus two phases in the expan-

sion of investment: the first is due to a particular opportunity for profitable investment; the second follows the rise in prices relative to costs, when profitable investment becomes general.

The secondary phase of expansion always contains the seeds of a reaction. As the supply of consumption goods increases, the price level must fall to the expense level. For several reasons the reaction in prices will generally bring about deflation. Producers who increased output with the expectation of higher prices restrict production and decrease their investment in working capital. At this stage monetary factors may also cause a disturbance in investment. The increased quantity of money needed to finance production will have depleted bank reserves, and the consequent restriction of credit, thru a high discount rate, involves a corresponding decrease in investment. In gold standard countries, an export of gold may be induced by the previous rise in prices—unless counterbalanced by restrictions on international trade and finance—and this becomes another disturbing factor. Altho in every inflation there are forces tending to bring about deflation, this could be avoided if the banking system would at first limit the tendency for investment to exceed saving, and later make good the deficiency when saving exceeds investment.¹⁸

¹⁸ J. M. Keynes, *A Treatise on Money*, vol. I, chaps. 16-18. For an earlier view bearing some resemblance to that of Keynes, see N. Johannsen, *A Neglected Point in Connection with Crises*, p. 88. "There is only one remedy for depressions, and that is, the prevention of Impair Savings. To attain this end, two methods are imaginable—first, by creating unlimited opportunities for profitable investment in building up new productive capital, so that all savings, no matter to what extent they accrue, can find investment in the Capitalistic Form . . . ; second, by checking the saving activity, so as to limit the aggregate of savings to such a volume as can find investment either in the Capitalistic Form or in Replacements, and thus prevent the very formation of an excess of savings."

It is difficult to say in what sense it is true that business cycles are purely a monetary phenomenon. Certainly it is not true that business cycles are always the direct result of variations in the price level, altho they are frequently caused and are always affected by changes in prices. It is in a broader sense that business cycles may be regarded as monetary in nature. In the first place, business cycles are most likely to arise in a monetary society where production and consumption, saving and investment, are carried on indirectly thru the mediation of money. In the second place, business cycles are in part the cause and in part the effect of the reciprocal disturbances in the economic system induced by monetary and industrial factors. And in the third place, business cycles can probably be controlled to a large extent by appropriate regulation of the monetary system, induced changes in monetary factors being utilized to offset changes in other factors. So understood, it is undoubtedly true that business cycles may be regarded as purely a monetary phenomenon.

5. Business Cycles and Economic Progress

It is generally accepted that the primary purpose of monetary management should be the maintenance of economic equilibrium. The cost to the community, particularly to the laboring class, of alternate periods of over-employment and under-employment is very great, and must be avoided. The lowered output during periods of depression is not balanced by the increased output in periods of prosperity. The most desirable condition would be continued full employment of the factors of production without the intensive and excessive employment of boom periods. It is probably impossible entirely to eliminate variations in business activity—"perfect adjustment is inconceivable." Nevertheless, it is possible to

minimize the prevailing recurring variations, and to secure relative stability in business activity.

Many economists have argued that inflation is necessary for economic progress. Changes in the industrial system requiring a shifting of the factors of production from one industry to another are facilitated by rising prices that permit higher rates of remuneration to the factors of production. The development of new enterprises requires the provision of large quantities of capital for the innovators. If the community's savings are insufficient for this purpose, inflation permits the extraction of forced savings from the people. A limitation on inflation must to some extent limit the development of new industries and the expansion of old industries. On this Robertson writes: "I do not feel confident that a policy which, in the pursuit of stability of prices, output and employment, had nipped in the bud the English railway boom of the forties, or the American railway boom of 1869-71, or the German electrical boom of the nineties, would have been on the balance beneficial to the populations concerned."¹⁴

It cannot be denied that the development of new industries and the expansion of old industries has frequently been hastened by inflation induced by over-extension of bank credit. Nevertheless, it is too much to say that economic progress is impossible without alternate periods of inflation and deflation. On the contrary, the annual savings of the community are enough to permit a fairly rapid advance in the material equipment of the community; and the hasty

¹⁴ D. H. Robertson, *Banking Policy and the Price Level*, p. 22. Professor Schumpeter regards credit inflation as a necessary device for providing innovators among business men with the means of acquiring productive resources for new enterprises. See, *The Theory of Economic Development*, chap. III.

development of industry, thru inflation, is frequently ill-advised. Continued full employment, by increasing the production of the community, would in the long run provide more real capital than is now secured thru voluntary and forced saving. The railways of England and the United States would have been built, perhaps better built, without the great inflation of the forties and the seventies. In short, while economic progress has generally been accompanied by inflation, the elimination of inflation will not end progress, but will make it more orderly. The conclusion of Keynes is worth noting: "Mr. Robertson's contentions, though they deserve serious attention, are not sufficient to dispose of the *prima facie* presumption in favour of aiming at the stability of purchasing power as a general rule, in preference to oscillations of the Credit Cycle." ¹⁵

6. Remedies for Depression

It cannot be expected that business men will deliberately manage their businesses for the purpose of preventing industrial fluctuations, even if they could. Nor can the banking system as at present organized be expected to prevent the credit cycle with its great variations in output and employment. Industrial fluctuations are a part of the existing organization of economic society; and the remedy must be undertaken collectively. Only a national monetary authority with sufficient control over the creation of credit and investment can manage the monetary system to avoid variations in business activity.

The best means of avoiding depression is to minimize inflation, for inflation carries within it the seed of reaction. If, however, efforts to avoid deflation have failed, positive steps must be taken to terminate it as quickly as possible.

¹⁵ J. M. Keynes, *A Treatise on Money*, I, 297.

This can be done by raising the price level to the expense level thru a restoration of the balance between investment and saving. In part public investment in the form of public works can be substituted for private investment.¹⁶ At the same time, action must be taken to induce a return to the normal rate of private investment by lowering the real rates of interest. This requires a minimization of the fall in prices, and a decrease in the nominal rate of interest. Sufficient control of the monetary system to prevent a continued fall in prices may involve a dissociation of money from gold. The nominal rate of interest can be lowered by a liberal policy in providing bank reserves, and by the purchase of securities on a

¹⁶ It is difficult to say precisely how great will be the effect of *additional* government expenditure on income, prices and employment. Under extreme conditions, it is conceivable that additional government expenditure will have no favorable effect, an increase in government expenditure being offset by a decrease in private expenditure. This is unlikely in a period of great depression. Assume that additional government expenditure is financed by loans created by banks, so that the quantity of money in the community is greater by the amount of the additional government expenditure than it would otherwise have been. If the income velocity of money is not reduced by government expenditure, the income of the community for that year will be increased by three times the amount of additional government expenditure, assuming that the annual income velocity of money is three. Further, the annual income of the community will remain higher by that amount until the government loans prevent the creation of bank loans for private investment, a condition that will not arise until there has been considerable recovery in business. Thus, additional government expenditure once made, the effect on national income continues, altho to a decreasing extent, until the period of prosperity is well under way. The effect on prices is more difficult to determine, altho the probability is that the effect of additional government expenditure on prices will not be great. The increase in employment will tend to be somewhat less than the increase in national income. It is interesting to note that J. M. Keynes using a different approach comes to much the same conclusion, *The Means to Prosperity*, pp. 6-12. Other important factors that must be given consideration are the effect of additional government expenditure on discount and interest rates, and on wage rates. Cf. R. G. Hawtrey, *Trade and Credit*, chap. VI.

scale sufficiently large to affect the price of, and inversely the yield on, securities. A bold policy quickly executed is more likely to be effective than a cautious policy extended over a considerable period.

Equality of the price level and the expense level can be secured by the raising of prices or the lowering of expenses. Because of the greater rigidity of the money rates of remuneration of the factors of production, it is more advisable to restore equilibrium by raising prices. However, if because of the monetary standard, equilibrium must be restored by a lowering of prices and incomes, a rapid deflation to the necessary price and income level would be best. Attempts to sustain prices, and wages, rents and interest rates, must extend the period of depression and prevent a quick restoration of economic equilibrium.

Chapter XVII

International Trade and Exchange

1. *The Balance of International Payments*

IN gold standard countries, stability in the monetary system requires an external equilibrium in international trade and finance as well as internal equilibrium in prices and expenses; and for the greater part of recent history, the maintenance of external equilibrium has been the primary object of central bank management. A disturbance of external equilibrium, because it affects the monetary system, is transmitted to every phase of economic life, and has important repercussionary effects on prices, production and employment. In a country that does not produce gold, a condition of external equilibrium requires that the claims of and the claims against nationals of that country should be such as to permit a net import of gold just sufficient to satisfy the industrial demand and the necessary normal increase in the monetary stock of gold of that country. The balance of payments that will bring about external equilibrium may be called the proper balance.

Assume, for illustration, that the claims of foreigners against business men of a country exceed the claims against foreigners. In a gold standard country, these excess claims, being paid in domestic money, will be converted into gold and exported by those holding the excess claims. If the central bank has no free gold, and if the member banks have no surplus reserves, the banking system must contract the

quantity of money in the country. The export of gold will make the gold reserve of the central bank insufficient to support the lawful money and the reserve deposits of member banks. To restore the proper ratio of its gold reserve to its liabilities, the central bank must reduce its liabilities—particularly the reserve deposits of member banks. This can be done by raising the rediscount rate and by selling securities. The effects of an export of gold are not exhausted with the reduction of the reserves of member banks. With reserves insufficient to sustain their deposit obligations, member banks will be compelled to reduce their loans and investments until their reserve ratio is normal. The contraction of bank credit will tend to reduce consumers' income and outlay, and will induce a fall in the price level, with all the consequences of a deflation. There will be a falling off in profits, in production, and in employment, a reduction in money rates of remuneration, and eventually a new equilibrium. With necessary changes, the effect of an import of gold in excess of the proper balance can be shown to be similar along precisely opposite lines. External disequilibrium is thus one important factor that may induce internal disequilibrium, with inflation or deflation.

It was stated that external disequilibrium arises from the inequality of the balance of claims between nationals and foreigners with the proper balance. The larger part of these claims arises from import and export of goods, altho these claims are not all from the sale and purchase of goods. Many services are performed by the business men of one country for the business men of other countries—for example, shipping, banking and insurance services of various kinds. Another group of claims arises because persons receiving income in one country prefer to spend this income in other countries—for example, in foreign travel, immigrant remit-

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Balance of International Payments, United States, 1930* (Millions of dollars)

Transactions	American claims against Foreigners	Foreign claims against Americans
International Trade:		
Merchandise, &c.	4,097	3,339
Freights (ship and railway).....	155	251
Tourist and passage payments.....	192	783
Insurance, advertising, royalties, &c... ..	165	158
Immigrant remittances	33	199
Charitable and missionary gifts.....	....	49
U. S. government transactions (except war debts).....	46	127
International Finance:		
Par value of new investments.....	50	406
Bond discount and bankers' commissions	66	....
Reduction of foreign deposits in U. S. ....	....	443
Interest on private investments.....	904	310
War debt receipts.....	241	....
Omissions and Inaccuracies.....	374	....
Settlement Items:		
Gold shipments	116	396
Gold earmarked.....	26	24
American paper currency exported (net)	20	....

* Department of Commerce, *The Balance of International Payments of the United States*, 1931, p. viii.

tances and charitable gifts. Still another group of claims arises from international financial transactions—not only loans, but payments of interest and principal. And in recent times, governmental claims for reparations and war debts

have been very important factors in international payments.

The nature of international transactions can be seen from the summary statement of the estimated claims of and against nationals and the government of the United States in 1930. In this year the shipment and earmarking of gold was \$142 million from the United States to other countries, and \$420 million from other countries to the United States. Such large transfers of gold are unusual, but not rare. The gold exports of some belligerent countries, and the gold imports of some neutral countries were far in excess of these large sums during the war period, 1915 to 1920. The flight from the British pound in 1931, and from the American dollar in 1933, gave rise to similarly large exports of gold. Such movements of gold are certain to have important disturbing effects on the monetary systems of the world.

2. Comparative Costs: Prices and Interest Rates

By far the larger part of international claims arises from the purchase and sale of goods and services. The nationals of one country buy or sell goods and services in other countries because the prices at which they can be bought and sold are more favorable abroad than at home. The forces that contribute to making the prices of certain goods or services higher or lower in one country than in another are complex, but they depend fundamentally on the supply and rates of remuneration of the factors of production, and their technical efficiency. A country tends to specialize in the production of goods and services requiring a large proportion of the factors of production that are relatively abundant, that have a relatively low rate of remuneration, or that are relatively more efficient technically—that is, those goods and services for which the costs of production are low in terms of productive effectiveness. As the rates of remuneration of

the factors of production are partly the result of their efficiency, it is generally said that each country specializes in the production of those goods and services for which its factors of production have a superior advantage or an inferior disadvantage.

With given conditions of demand, the imports of a country are determined by the price level of goods at home and the expense level of production abroad; and the exports of a country are determined by the price level of goods abroad and the expense level of production at home. In a gold standard country that does not produce gold, external equilibrium requires a relative price level and a relative expense level that will bring about an excess of exports sufficient to induce an import of gold that will provide for the industrial demand and the necessary normal increase in the stock of monetary gold—that is the proper balance on international payments. A tariff at home, by making more difficult the import of goods, raises the price level at which external equilibrium will be established; and a tariff abroad, by making more difficult the export of goods, lowers the expense level at which external equilibrium will be established. If the prevailing price level and expense level are incapable of maintaining external equilibrium in a gold standard country, forces will be at work tending to vary prices and expenses of production until external equilibrium is established. However, the movement of prices and incomes in a country disturbs internal equilibrium and induces inflation or deflation. The dissociation of the monetary system from gold tends to bring about external equilibrium automatically, with some disturbance to the prices of import and export goods, but with little effect on the price level of goods in general and on the rates of remuneration of the factors of production.

If a country is engaged only in international trade—as

distinguished from international finance—the existence of external disequilibrium is due to the failure of its price level and its expense level to be in proper relationship to the prices and expenses of other countries. The payment of the balance on international trade ultimately provides its own corrective, altho the consequences of the transfer of gold may be wholly undesirable. Where international loans are also made, the matter is more complicated. But if loans are made only to the amount by which the actual balance exceeds the proper balance on international trade, there can be no undesirable movements of gold to induce inflation or deflation. The complete requirement for external equilibrium is therefore the equality of international loans and the amount of the actual balance in excess of the proper balance on international trade.

The demand for and the supply of foreign loans are determined by the relative interest rates in the borrowing and lending countries. When foreign loans are made by Americans, the reason must be that foreigners can borrow at a lower interest rate in this country, and Americans can lend at a higher interest rate abroad. If foreign loans in gold standard countries are not equal to the amount by which the actual balance exceeds the proper balance on international trade, external disequilibrium will arise. The equality of international loans and excess balances on international trade can be restored by an appropriate change in the discount rate. For example, if the international loans made by a country are greater than the excess of its proper trade balance, an increase in the discount rate will induce a fall in prices (increasing the balance on international trade) and a rise in the interest rate (decreasing the amount of international loans). Unfortunately, it is impossible to dis-

courage foreign borrowers without discouraging home investors, and a rise in the discount rate will bring about the very condition it was designed to check—internal disequilibrium, a fall in the price level and a consequent deflation.

One form of international lending requires special attention. There are funds continually seeking short-term investment that are remarkably mobile, being made readily available in any important financial center. The factor that determines the direction of the flow of short-term loans is the discount rate. It is quite possible for a high discount rate to exist, for a short time, with a low long-term interest rate, so that long-term loans may be made in one direction at the same time that short-term loans are made in the other direction. Thus the deposits of foreigners in New York banks and their loans on the New York call market were exceptionally high during the stock market boom of 1929; while at the same time large loans were made to foreigners by the New York market on long-term bonds. The cause of a flow of short-term funds is a relatively high discount rate. Many countries have used the discount rate as a device for minimizing the outward or inward flow of gold—external disequilibrium. One important point must be noted. If short-term funds are to be attracted by small differences in discount rates, there must be assurance that the funds can be returned to where they are wanted later without loss. For if \$486,650 in gold is deposited as £100,000 in London to take advantage of a discount rate 2 per cent higher than in New York, a fall of three cents in sterling exchange will be sufficient to wipe out the entire gain of a period of about four months. Thus, the effectiveness of discount rates in attracting short-term funds depends in large part on the stability of exchange rates.

3. Foreign Exchange Rates

In all countries actively engaged in international trade and finance, there are a large number of business men—particularly importers—in need of foreign currencies to meet obligations in other countries. And in every important trading country there are foreign exchange dealers prepared to buy and sell foreign currencies at a profit. The value of one currency in terms of another is generally spoken of as its exchange rate on the important commercial center of the other country. London exchange in New York refers to the value of sterling in terms of dollars. Foreign exchange rates are generally quoted in two forms—the number of units of domestic money that exchange for a unit of foreign money; or the number of units of foreign money that exchange for a unit of domestic money. In this country the first method is commonly used, and exchange is quoted in dollars and cents per unit of foreign money.

Exchange dealers are generally bankers engaged in providing funds on short-term loan to finance international trade, stock market operations or domestic trade. As bankers and exchange dealers they find it convenient and profitable to keep balances in various commercial centers. These balances at home and abroad are available to business men who wish to secure funds in one country in exchange for funds in another. Thus, exchange dealers are always prepared to sell sterling for dollars or dollars for sterling provided the rate at which these currencies are sold compensates them for the cost of making the transaction, including the inconvenience of a deviation from the normal distribution of balances between London and New York. When exchange dealers find their London balances becoming too large, they raise the rate at which they sell dollars and reduce the rate at which they

sell sterling. The effect of this change in exchange rates is to correct in part the maldistribution of balances, for some who would have purchased dollars at the lower rate postpone their purchases or give them up entirely, while some who would not otherwise have purchased sterling at this time are induced, by the lower rate, to make their purchases now.

Foreign Exchange*

New York, January 19, 1935

Sterling—Par \$8.2397 per sovereign	Spain—Par 32.6693 cents per peseta
Demand \$4.88½	Demand 13.66
Cables 4.88½	Cables 13.66
France—Par 6.6335 cents per franc	Sweden—Par 45.370 cents per krona
Demand 6.58½	Demand 25.18
Cables 6.58½	Cables 25.18
Germany—Par 40.3325 cents per mark	Switzerland—Par 32.6693 cents per franc
Demand 40.05	Demand 32.34
Cables 40.05	Cables 32.34
Italy—Par 8.91112 cents per lira	Montreal—Par \$1.693125 per Canadian dollar
Demand 8.52	Demand 100.00
Cables 8.52	
Belgium—Par 23.5419 cents per belga	Mexico, D. F.—Par 84.40 cents per silver peso
Demand 23.32	Demand 37.85
Cables 23.32	
Holland—Par 68.0567 cents per florin	Calcutta—Par 61.7978 cents per rupee
Demand 67.46	Demand 36.81
Cables 67.46	Cables 36.87
Norway—Par 45.3740 cents per krone	Japan—Par 84.3957 cents per yen
Demand 24.53	Demand 28.37
Cables 24.53	Cables 28.43

* New York Times, January 20, 1935. Parity is based on the gold value established by Presidential proclamation, January 31, 1934.

The greatest limitation upon variations in rates of exchange exists in countries where money is redeemable in gold or silver. Obviously, no one will accept much less for a unit of foreign money redeemable in gold or silver than the amount for which that quantity of gold or silver can be sold at the domestic mint or to bullion dealers. The normal value of a unit of money redeemable in gold in terms of another unit of money purchasable with gold tends to be the ratio of the purchase and sale prices of gold at the two mints.¹ This ratio is the mint par of exchange, and it can be computed in two ways—by the ratio of the fine gold content of the two coins, and by the ratio of the statutory price of gold at the mints or central banks of the two countries. For example, the mint par of exchange of dollars and sterling prior to 1931 could be determined from the ratio of the fine gold content of the sovereign (113.0016 grains) and the dollar (23.22 grains). The mint par of exchange was $\frac{113.0016}{23.22}$, that is, \$4.86656 per pound sterling.

A sovereign and \$4.867 were not always precisely equal in value, altho each contained 113 grains of fine gold, for gold is not always equally valuable in different places. Nevertheless, there was a limit to the difference in value of a sovereign and \$4.867, for 113 grains of gold must be nearly equal in value in New York and London, since gold can be sent at small expense to the place where its value is greater. Before 1931 a holder of British sovereigns would not take fewer dollars for his sovereigns than he could obtain by sending them to New York, paying the expenses of the transaction, and selling them to the mint. A transaction of this kind gives rise to expenses for packing, shipping and

¹ Strictly speaking, the normal rate of exchange is the mint par of exchange plus the commission of foreign exchange dealers.

insuring the gold, and involves a loss of interest for a short period. These expenses vary from time to time, altho they tend to be somewhat less than two cents for a pound sterling. For this reason when sterling exchange fell below approximately \$4.847, gold was shipped to New York; and when sterling exchange rose above approximately \$4.887, gold was shipped to London. The gold standard kept variations in dollar-sterling exchange within these gold shipping points, altho the market rate of exchange could be anywhere between these points.

When foreign exchange dealers in gold standard countries find their balances in different centers disproportionate to their needs, they convert their surplus balances into gold and increase their balances in centers where they are low. In gold standard countries, gold is used to acquire funds in other centers, because large quantities of gold can be purchased at a fixed price, transported cheaply, and sold without difficulty at a fixed price in other gold standard countries. If other commodities could be bought and sold in large quantities as economically as gold, such commodities would be used to replenish foreign balances, and their expense of shipping would be the limit of the variation in normal rates of exchange.

4. Purchasing Power Parity

The demand for foreign exchange on any country is principally for the purpose of securing command over real resources in that country, that is, goods for import. The rate that will be paid for exchange on any country will be determined by the prices that can be realized in other countries for the goods purchased with the foreign exchange.

The manner in which the purchasing power of two currencies affects their rate of exchange can be seen from a

concrete illustration. Assume that the market rate of dollar-sterling exchange is \$5.10, and that prices in London for American export goods are such that at the prevailing rate of exchange American exporters secure an abnormal profit from the sale of export goods. There will tend to be an increase in American exports to England. The supply of a larger quantity of American goods in London will drive down their sterling prices, and the increased supply of sterling exchange from the sale of these goods will drive down the dollar rate on sterling. At some rate of exchange, say, \$5.00, prices in London and in New York will be such that exporters and importers can no longer secure an abnormal profit by sending goods in either direction; and this is the rate of exchange at which equilibrium in international trade will be established.

During the period of monetary disturbances brought about by the war, when exchange rates were moving rapidly and seemingly without reason, Professor Cassel stated this theory in its best known form.²

Our willingness to pay a certain price for foreign money must ultimately and essentially be due to the fact that this money possesses a purchasing power as against commodities and services in that foreign country. On the other hand, when we offer so and so much of our own money, we are actually offering a purchasing power as against commodities and services in our own country. Our valuation of a foreign currency in terms of

² G. Cassel, *Money and Foreign Exchange After 1914*, p. 138. Cf. what Marshall said in 1899 before the Committee on Indian Currency. "Broadly speaking, the Indian exchange, both before and after the closing of the mints [to silver], has indicated the proportion between rupee prices at Indian ports and sterling prices at English ports: and, subject to allowance for freights, etc., between India and England, the rule holds that the exchange . . . is the ratio of sterling prices to rupee prices." A. Marshall, *Official Papers*, p. 293.

our own, therefore, mainly depends on the relative purchasing power of the two currencies in their respective countries.

The exchange rate that ought to prevail on the basis of relative prices in two countries, Cassel calls the purchasing power parity. It is clear from his statement that if the sterling exchange rate in 1914 was \$4.867, when the American and British price indexes were 100, then in any later year the purchasing power parity for sterling exchange should be the ratio of the index numbers of American and British prices multiplied by \$4.867. In fact, the sterling-dollar exchange

Purchasing Power Parity and Exchange Rates*

Year and Month	U. S. Index	British Index	Purchasing Power Parity	Actual Rate
1920 January	233	288	\$3.9370	\$3.6779
May	247	305	3.9409	3.9488
September	226	282	3.9000	3.5103
1921 January	170	232	3.5662	3.7420
May	145	191	3.6946	3.9754
September	141	175	3.9209	3.7240
1922 January	138	156	4.3049	4.2248
May	148	159	4.5297	4.4461
September	153	150	4.9638	4.4307
1923 January	156	153	4.9619	4.6546
May	156	155	4.8981	4.6257
September	154	150	4.9964	4.5422
1924 January	151	161	4.5643	4.2591
May	147	161	4.4431	4.3608
September	149	166	4.3682	4.4605

* J. P. Young, *European Currency and Finance*, Part I, pp. 455-456.

rate has not conformed very closely to the ratio of the purchasing power of the two currencies. The preceding table shows the variation in sterling exchange and in purchasing power parity for the years following the removal of government support of the exchange market.

The statistical evidence indicates that rates of exchange do not conform closely to the ratio of the purchasing power of currencies. Altho the rate of exchange does move somewhat in harmony with relative price levels, there are many large deviations of actual exchange rates from purchasing power parities. It has been argued that one reason for the divergence of actual exchange rates from calculated parities was the unusual economic conditions of the period—that the complexities of government control, speculation and currency difficulties may have combined to prevent the realization of the purchasing power parity as the actual rate of exchange. It has also been argued that the index numbers used are not an accurate measure of purchasing power. These arguments undoubtedly have some validity, but they cannot account for the large deviations of actual exchange rates above and below the calculated purchasing power parities within relatively short periods. The conclusion is inevitable that exchange rates are not determined by the relative price levels for goods and services in two countries if the goods and services do not enter into international trade.

There is undoubtedly a general tendency for exchange rates to vary with the relative price levels of two countries. Whatever correlation there is between the purchasing power of currencies and their exchange rates is due to the inclusion of import and export goods in the general index of prices, the use of import and export goods as raw materials for the production of home goods, and the tendency for the costs

of producing home goods and export goods to vary together. If in two countries there were no change in the demand for import goods relative to goods domestically produced, it would tend to be true that the normal rate of exchange would vary with changes in the ratio of the purchasing power of the two units of money. But if in one country there is an increased demand for import goods relative to goods domestically produced, and in another country a decreased demand for import goods relative to goods domestically produced, the normal rate of exchange will no longer tend to vary in proportion to changes in the ratio of the purchasing power of the currencies.

It is, of course, true that the normal rate of exchange of two currencies is the ratio of the price levels of import and export goods in the two countries—allowance being made for the costs, direct and indirect (including tariffs) of transporting goods between the countries. This tends to be true not only of the price levels of import and export goods in general, but also of each individual good entering into international trade. Even here, exception must be made for goods on which trade restrictions are placed in the form of quotas limiting the volume of imports. Under such conditions there is no necessary relation between prices and exchange. The most generally valid statement that can be made is that the rate of exchange for two currencies tends to be that which under given conditions of trade will bring about an equilibrium in the reciprocal demand for their goods and services, including loans and interest payments. In this, relative prices are the one most important factor. But other conditions, such as relative interest rates, the cost of transport, tariffs and other trade restrictions, are of some importance in determining normal exchange rates.

5. Imports and Employment

A question that has recently attracted much attention is the relation of imports to employment. In many countries campaigns are conducted to induce consumers to purchase domestic goods on the ground that a reduction of imports will increase employment in domestic industry. And in many countries tariffs, import quotas and administrative restrictions have been imposed for the particular purpose of increasing employment. In considering the effect of imports on employment it will be assumed that a country on a gold standard excludes goods formerly imported by the imposition of a tariff.

When a country has a considerable number of unemployed, the indications are that the real rates of remuneration for the factors of production are excessive—that is, the expense level is high relative to the price level. Under the circumstances, a rise in the price level, the expense level remaining unchanged, will increase the volume of employment. The placing of a tariff on imports tends to increase the foreign balance of a country for the time being. There will be a flow of gold into the country, and prices will rise to a level higher than would otherwise have prevailed. If the money rates of remuneration do not rise in proportion to prices—that is, if the real rates of remuneration fall—the volume of employment will undoubtedly increase. The cause, it must be noted, is not that the labor formerly needed to produce imported goods abroad is now used to produce the same goods at home, but that the rise in the price level has made business more profitable and has caused business men to increase their demand for the factors of production. A tariff cannot have this effect in countries not on a gold standard.

The exclusion of imports will not increase employment in this manner if the rise in prices is offset by a corresponding rise in the rates of remuneration of the factors of production. Assume that a country's demand for imported goods is elastic, and that the foreign demand for its exports is also elastic. If a high tariff is placed on imported goods, so that all imports are excluded, the result will be that some of the goods formerly imported will be produced domestically. These are the goods for which the comparative disadvantage of the country is not great. More will also be produced of the goods ordinarily made for domestic consumption exclusively. Finally, more will be consumed (not produced) of goods ordinarily exported. That is, domestic consumption of goods domestically produced will increase, altho the satisfaction from the new consumption will be less than from the old consumption of imported goods.

Altho the domestic consumption of domestically produced goods will increase, the production of such goods will not increase. The exclusion of imports increases the country's balance on international payments, and gold flows into the country. As the larger quantity of gold enters into the monetary system, prices rise relative to the prices in other countries. As the price of the country's exports, measured in terms of foreign currencies, is increased, the rest of the world will restrict the consumption of its exports, using the same products of other countries, or confining consumption to available domestic products. In this manner a restriction on imports results in a falling off in exports; and altho domestic consumption of domestically produced goods increases, this is ordinarily insufficient to offset the loss of employment in export industries. This necessarily follows, for the real income of the community is diminished by the exclusion of

imports, and if the real rates of remuneration of the factors of production are not reduced, the net income of business men will be less than formerly, and business enterprise will be further restricted. There is little likelihood, ordinarily, that the exclusion of imports will increase employment in a country if the real rates of remuneration of the factors of production are not reduced by the rise in prices.³

Nevertheless, there are two hypothetical instances in which a temporary increase in employment can be brought about, altho at the expense of consumers. The gain to the newly employed, however, will probably exceed the loss to consumers, so that in these instances a tariff would be desirable if there were no repercussionary effects. Assume that there is a large amount of unemployed labor which cannot be re-employed in the near future because the income of business men is less than business earnings, so that they are deterred from increasing their employment of the factors of production.

1. Assume that the demand for a country's exports is inelastic, and that its demand for imports is elastic, so that it is less difficult for this country to substitute domestic consumption for imports than for other countries to substitute other consumption for its exports. If people in this country are prepared to finance foreign purchases of its exported goods, it is conceivable that for some time (short, rather than long) it can continue to export without importing. In the long run the present excess of exports must be balanced by an excess of imports for the purpose of paying interest and principal on the debt. In fact, the possibility of increasing employment under these conditions by excluding imports is limited, and of little practical importance. The elasticity of demand for the exports of any one country is

³ R. F. Harrod, *International Economics*, p. 195.

in fact very great; and the possibility of securing investment in foreign securities during a period of extreme depression is very slight.

2. Assume that the demand for imported goods in a country is inelastic; that the domestic cost of production of imported goods is little above the foreign cost of production; that the demand at home for exported goods is very elastic; and that exported goods are produced with large quantities of highly specialized capital. Under these conditions, it is possible that the exclusion of imports will increase domestic employment. Since the demand for imports is inelastic, the exclusion of such goods will result in the domestic production of the same goods; and since the domestic cost of production for these goods is little higher than the former price, there will not be a large falling off in consumption. Additional employment will thus be created in industries producing goods formerly imported. What will become of the export industries? They will supply some of their former exports to the factors of production now engaged in producing at home the formerly imported goods. The export goods will have to be sold at a price somewhat below the normal expense of production; but as the demand for these export goods in domestic consumption is very elastic, the fall in price will be slight. Further, as these goods are produced with large quantities of highly specialized capital, the falling off in production cannot be great in the short run.

Under such conditions it is conceivable that the exclusion of imports will result in an increase in domestic employment for a short time; and it is conceivable that with improvements in production, if money rates of remuneration do not rise proportionately with efficiency, the expense level will fall until it is in equilibrium with the price level, and employment will become normal. However, the coincidence of so

many conditions is altogether unlikely. Moreover, it must be noted that the imposition of a tariff has unfavorable repercussionary effects in other industries by lowering the real rates of remuneration necessary for economic equilibrium; and if the prevailing rates are not lowered, further unemployment may be induced that will more than offset the gain from the exclusion of imports. Finally, a remedy of this kind is of limited importance in a country whose tariffs are already high, whose imports are small relative to its domestic production and to the amount of unemployment, whose imported goods are the raw materials of further production, and whose imports cannot be replaced by domestic production of the same kind. The remedy is not, therefore, applicable to the United States.⁴

6. *Exports and Exchange*

Under normal conditions, whenever the balance of international payments moves against a country, the exchange rates on foreign currencies rise. The effect is to make less profitable the import of goods, and more profitable the export of goods, for a given foreign price becomes equivalent to a higher domestic price. This movement of the exchanges may affect the volume of imports and exports sufficiently to restore equilibrium in international trade, if the disturbance is slight. If equilibrium in international trade cannot be secured by a movement of prices, it can always be accomplished, after a time, by a sufficiently large change in the exchange rate of a currency. The large movements in exchange rates in recent years have been the result of a disturbance in the equilibrium of international trade that could

⁴ W. Beveridge, *Tariffs, the Case Examined*, chap. VI. On the relation of imports to employment, see also J. A. Hobson, *The Economics of Unemployment*, Appendix; and A. C. Pigou, *A Study in Public Finance*, pp. 218-227.

not be corrected by the price movements that were permitted.

The effect of a fall in the exchange rate of a currency on the volume of imports and exports does not depend on the cause of the exchange movement. There is this distinction, however, between a fall in exchange brought about by disequilibrium in international trade and by a fall brought about by a speculative flight from a currency. If a movement in exchange rates is induced by disequilibrium, exchange rates will of themselves tend to that level at which equilibrium will be restored. If the currency of a country is undervalued on the exchange market, the increase in exports and in the demand for domestic exchange will bring about a rise in the exchange rate of the currency; and the volume of exports relative to imports will increase only enough to restore equilibrium in international trade. Even with a depreciated exchange, a country cannot export in value more than it imports, unless it is prepared to accept the securities, currencies or gold of other countries in exchange for its exports.

The situation is somewhat different when the movement in exchange rates is brought about by a speculative flight from domestic currency. The volume of exports under such conditions will be equal to the volume of imports plus the quantity of domestic money converted into foreign balances. So long as there is a flight from domestic currency, exports will continue to exceed imports, and the rate of exchange will remain below the normal equilibrium level. Later, when these balances are returned, imports including gold will exceed exports by an equal amount. The fall in the exchange rate of the dollar in 1933 was in large part due to a speculative flight from the dollar to other currencies, the purchasing power of which was regarded as likely to be greater in the future. The large increase in exports relative to imports can

be accounted for by this conversion of dollar balances into foreign balances.

For a time, the monetary authority of a country can succeed in establishing as low a rate of exchange as it wishes, provided it is prepared to accumulate balances of foreign exchange and gold; and provided its action is not offset by the activities of the monetary authorities of other countries. There has been some objection on the part of gold standard countries to deliberate depreciation of exchange by countries off the gold standard. A fall in exchange rates that is not brought about by rising domestic prices of export and import goods, induces business men in gold standard countries to acquire depreciated exchange with gold. The loss of gold impairs the reserves of gold standard countries, and they must take steps to make imports less profitable and exports more profitable. Without going off the gold standard, this can be done only thru a fall in the gold price of imports and exports. As prices in gold standard countries may be so low that the factors of production cannot be fully employed, a further decline in prices is not desirable. It should be noted that this objection would be lessened if countries with depreciated exchange would acquire foreign currencies instead of gold.

The object of the exchange policy of the United States since March, 1933, has been two-fold—to increase the volume of domestic production, and to raise the general level of domestic prices. It has already been stated that the depreciation of exchange and the flight from a currency increase the volume of exports for a short time. This increase is largest for those goods for which the world demand is elastic and for which the domestic supply is flexible. The increased volume of exports provides additional employment in the country with depreciated exchange, altho employment in

export industries is not increased by the amount of the additional exports, because the higher prices that accompany the depreciated exchange diminish domestic consumption of export goods. The increase in production and employment is not confined to the export industries, for the falling off in domestic consumption of export and import goods with the rise in their prices, induces increased consumption and production of goods not entering into international trade.

The effect of depreciated exchange on the price of export goods has already been indicated. With a fall in exchange rates, exporters find that they can convert the foreign prices of their goods into a larger sum of domestic money. To some extent exporters will increase exports by offering goods at lower foreign prices, altho at equivalently higher domestic prices. The rise in export prices will tend to be greatest for the goods for which foreign demand is relatively elastic and domestic supply relatively inflexible. Exchange rates do not directly affect the prices of goods not entering into international trade. In ordinary times, when the factors of production are fully employed, a rise in export prices makes such industries more profitable, and induces a larger proportion of the factors of production to be employed in export industries. The diversion of productive resources from other industries decreases the supply of non-export goods, and tends to increase their prices, until the profitability of business, and the remuneration of the factors of production, are approximately equal in all industries. In periods of depression, a moderate rise in export prices cannot affect the prices of non-export goods in this way.

Under such conditions, exchange rates can raise domestic prices only by increasing the expenditure of the community on domestic non-export goods. There are two factors that may bring this about. First, an increase in the volume and

price of export goods must increase the income and the expenditure of the factors of production employed in the export industries. Second, a rise in prices of import and export goods tends to divert part of the community's expenditure from such goods to other goods, increasing the volume of production and the price level of non-export goods. The effectiveness of this second factor depends on the nature of the demand for import and export goods, being positive if the demand is elastic and negative if the demand is inelastic. Fundamentally, the expectation is that the initial rise in prices by making business more profitable will increase the demand for bank credit, and to the extent that bank credit is expanded to finance production—thus increasing prices and employment further—depreciation of exchange succeeds in its objects. If bank credit is not expanded by the induced rise in prices, employment will not be increased to any great extent merely because the exchange has been depreciated.

It has been argued that the policy of depreciating the exchange value of a currency is undesirable because "no definite, predictable rise in the commodity price level can be assumed to follow a given depreciation of the currency."⁵ Evidence is cited that the British price level has not risen in proportion to the depreciation in sterling exchange, even after allowing for the further decline in gold prices all over the world. There is nothing in this to prove that a fall in exchange rates does not result in higher prices. When Great Britain went off the gold standard in September, 1931, the gold prices in that country were not equilibrium prices, but higher than the prices essential for balancing its international payments. Part of the failure of prices in Great Britain to rise to the calculated level is accounted for by the fall in the gold prices of its export goods necessary to establish

⁵ L. Pasvolsky, *Current Monetary Issues*, p. 125.

external equilibrium. The fall in exchange rates does not give rise to a proportionate increase in the price level, but it does bring about some increase in prices and employment in a country.

There are some objections to a reduction in the exchange rate by purchases of gold. The flight of balances may impair the working capital of a country, diminish the volume of domestic investment, and perhaps in other ways decrease production and employment. On the whole, the dangers from this side are small. But acquiring gold by too large a depreciation of exchange does impair the reserves of gold standard countries, leads to a further fall in gold prices, and by reducing the volume of production and employment in other countries, diminishes the volume of exports that can be sold on the basis of equilibrium in international trade. Little can be gained from any policy that is at the expense of other countries, for such policies inevitably lead to protective and retaliatory measures. If a depreciation of exchange below the equilibrium level is necessary to induce an initial rise in prices and an eventual expansion of bank credit, this should be done by acquiring foreign currencies rather than gold. The risk of loss in holding foreign balances is more than offset by the elimination of the danger of inducing further deflationary measures in gold standard countries.

PART FIVE

Monetary Management

Chapter XVIII

Monetary Stabilization and Economic Equilibrium

1. *The Basis for Equilibrium*

THE functions of a monetary system are to regulate the production, the distribution and the utilization of the national income. The well-being of the community depends upon the full and proper employment of the factors of production—the labor and enterprise, capital and natural resources—at its disposal; the distribution of the national income among the co-operating factors of production to realize the maximum welfare consistent with the maintenance of full production; and the utilization of the national income in consumption and investment to provide for present needs and for the maintenance of the progressive efficiency of the factors of production. The best monetary system is that which will most satisfactorily perform these functions; and the ultimate object of monetary management must be to facilitate the proper production, distribution and utilization of the national income.

For more than half a century, the leading commercial countries of the world maintained the gold standard as the basis of their monetary systems. In this period great industrial progress was made, but the monetary system did not contribute to this progress. The period since the gold standard was widely adopted has been one of unusual instability in prices; and this instability has led to a failure to secure the proper production, distribution and utilization of the

national income. The periodic inflation and deflation induced in large part by instability in prices has led to alternate over- and under-employment of the factors of production; it has diverted the distribution of the national income in a manner not conducive to the full employment of the productive resources of the community; and it has failed to assure the best utilization of the national income in consumption and in investment. In times of inflation, the excessive production of investment goods has been made possible by forced savings levied on consumers; and in times of deflation, the savings of the community have not been used in the production of investment goods.

The periodic variations in production are not entirely of monetary origin, and they cannot be entirely eliminated by monetary management. But to a large extent business cycles are induced by disturbances inherent in a monetary system managed with a view to maintaining the convertibility of money into gold; and to some extent even non-monetary disturbances could be offset by proper management of the monetary system. Under any circumstances, the monetary system could be managed to minimize the instability of prices, and to avoid the more extreme fluctuations in business activity. That is not to say that all the difficulties of the world have their origin in money. Even a perfect monetary system cannot solve all the economic problems of the community, the problems rooted in the organization of industry and of society. But a good monetary system can do much to minimize these difficulties; and it can eliminate the greatest of all wastes in our society—the waste of unused human and material productive resources. This must be the primary purpose of monetary management—to bring about economic equilibrium in the production, distribution and utilization of the national income.

In a society of free enterprise where production is undertaken for profit, the immediate cause of industrial fluctuations is the failure to maintain the equality of the level of prices received by business men and the level of expenses paid by business men. The first step in monetary reform must be to permit such management of economic affairs as will maintain the equality of the price level and the expense level. Generally speaking, the expenses of production—fundamentally, the money rates of remuneration of the factors of production—are not subject to control. To a large extent they are governed by custom and contract, and they are not responsive even to great changes in the demand for the factors of production. The maintenance of equality of the price level and the expense level must therefore be sought in management of the price level—that is, the monetary system.

The monetary system has hitherto been managed with the two objects of maintaining convertibility of money into gold and stability in exchange rates. It has been implicitly assumed in a monetary system of this sort that the expense level can be controlled to maintain economic equilibrium. A divergence of the price level from the expense level will affect profits, and a change in profits will affect the demand of business men for the factors of production. The expectation has been that after a time the change in demand will alter the money rates of remuneration and will re-establish the equilibrium of the price level and the expense level. In short, in any economic society some forces are presumed to exist that bring about equilibrium. Hitherto this has been attempted thru control of the expense level. Under ordinary conditions, with small movements in the price level, adequate adjustments have been possible either thru variations in the monetary rates of remuneration, or thru changes in

productive efficiency not accompanied by corresponding changes in the money rates of remuneration. But such remedies are inadequate with large movements in prices; and they are impossible in a society in which the money rates of remuneration are becoming less sensitive to changes in the demand for the factors of production. If industrial equilibrium is to be maintained, it is essential that the rigidity in the expense level should be offset by flexibility in the price level. This is impossible without a monetary system managed primarily for the purpose of maintaining equilibrium.

2. Stabilization of Prices

The evils of fluctuating prices have attracted attention for many centuries. In recent times the technique of measuring price changes has been highly developed; and proposals for stabilizing prices have been frequently made. There are, of course, many price levels—retail prices, wholesale prices, international prices, and many others. At various times each of these price levels has been suggested as the appropriate one to stabilize. In favor of stabilizing the retail price level, it can be said that the value of money is properly measured by the goods and services for final use that can be purchased with money. The difficulties of stabilizing the retail price level have already been indicated in the discussion on index numbers. The available data are insufficient, and the nature of the goods and services vary too much from place to place and from time to time to permit great accuracy in an index number of retail prices. It is not essential, of course, to secure perfect stability. For all practical purposes it would be sufficient if changes in the price level could be confined to small variations about an accepted norm.

Most proposals for stabilizing prices have had in view the

elimination of variations in the wholesale price level. Aside from the greater ease of securing adequate data for wholesale prices, this price level has the additional advantage of measuring the prices received by most business men. It is the relationship of this price level to the expense level that determines whether business men will increase or decrease their demand for the factors of production. The stabilization of wholesale prices would therefore eliminate one factor tending to bring about alternate periods of inflation and deflation. Generally speaking, the expense level is not likely to change rapidly in industrial countries; and disequilibrium has generally been brought about by large changes in the price level. With a relatively stable level of wholesale prices, it is unlikely that deflation and industrial depression would be so common or so severe as it has been with a monetary system based on gold. From this point of view, stabilization of the wholesale price level is particularly desirable as the immediate object of monetary management.

The objection to stabilization of wholesale prices, or of any price level of goods, has generally been that the maintenance of such prices is likely to lead to inflation. The efficiency of the factors of production has been increasing steadily, and this technical progress is likely to continue. With the prevailing rigidity in money rates of remuneration, an improvement in technical efficiency reduces the money cost of producing a unit of output. If the wholesale price level is stabilized under such conditions, it must lead to a rise in the profits of business men and to inflation. Typical of this criticism of the proposal for stabilizing wholesale prices, is the statement of Professor Monroe:¹

¹ A. E. Monroe, "The Standard of Value," *Quarterly Journal of Economics*, February, 1932, p. 265.

Stabilization according to the first of these means that money prices will not be allowed to drop when labor becomes more efficient. This buoying up of prices in the face of an increased output of goods, it is evident, requires an addition to the money supply. The effect of this will be to widen the spread between the entrepreneur's expenses and his receipts. Selling in a market where price per unit has not fallen, he has to pay out less for labor, less of it being now required and its price (money wages) having not yet risen as it eventually must if money prices are kept stable in the face of greater output per unit of labor. Inflation, then, is not always eliminated by keeping the purchasing power of money stable in terms of commodities.

It is to be noted that with stabilization of wholesale prices, deflation is still possible, altho unlikely. The desire for higher money incomes cannot be overlooked, and this desire is not checked by consideration of the necessity of maintaining equilibrium.

This criticism of the proposal to stabilize wholesale prices has not always been accepted as justified. It has already been suggested that there is nothing very objectionable in a slight inflation. It is probable that the working class can protect itself from over-employment, and it is possible that part of the excess profits accruing to business men at the expense of capitalists and landowners will be shared with workers in the form of higher wages. Robertson has given his approval to the soundness of the view that the public welfare may best be served, under the existing organization of society, by a slight inflation. "So long as the control of production is in the hands of a minority, rewarded by means of a fluctuating profit, it is not impossible that a gently rising price level will in fact produce the best obtainable results, not only for them but for the community as a whole."² There could be no

² D. H. Robertson, *Money*, p. 150. Cf. *Banking Policy and the Price Level*, pp. 26-27.

objection to a gently rising price level if the workers were assured the same rate of real wages they would secure under equilibrium conditions, and if the gain of business men at the expense of capitalists would not bring about undesirable repercussions on the volume of savings and investment. The repercussionary effect of inflation on savings and on progress in production, and the probability that workers will not succeed in securing the equilibrium rate of real wages with slight inflation is reason for rejecting stabilization of wholesale prices as an ideal object of monetary management.

Still another basis for stabilizing prices has been suggested by Keynes. He proposes that as stability of exchanges is regarded as important by business men and statesmen, the price level of goods entering into international trade be stabilized. For short periods, such a standard would not differ very much from the wholesale price level; altho in long periods, changes in reciprocal demand for goods entering into international trade, and changes in the effectiveness of the factors of production in different countries, may bring about inflation or deflation of a persistent kind in countries managing their monetary systems to stabilize international prices. Altho this objection is not conclusive, it must nevertheless be given great weight in considering the desirability of stabilizing the price level of international goods.

3. *Stabilization of Incomes*

An alternative proposal that has received wide approval among economists has been to stabilize money incomes rather than prices. "In a progressive community," writes Pigou, "the goal at which credit regulation can most usefully aim is not price stabilisation in an absolute sense, but price stabilisation adjusted to the trend of real income per head; that is to say, a state of things in which prices fall in inverse

proportion to the upward trend of average real income.”³ A similar proposal has been made by Hawtrey. Of the alternative of stabilizing prices or consumers’ outlay—in the long run equivalent to consumers’ income—he writes: “The better alternative seems to be to aim at making the consumers’ outlay constant. But, of course, it must not be absolutely constant; it must vary with the population, and must also vary with the quality of the work they do. If that ideal could be attained, the value of the monetary unit in terms of human effort would be kept fixed.”⁴

If every person in the community contributed directly or indirectly to the production of the national income, there would be little difficulty in interpreting the proposal to stabilize average money income. But the volume of the factors of production does not vary precisely with the population of the community, so that stabilization of average money income might lead to a progressive fall in the money rates of remuneration of all factors of production. A better statement of Pigou’s view is found in his more recent *Theory of Unemployment* in which he defines the standard monetary system, evidently that which he prefers, as one in which the total money income of the community varies directly with the volume of employment of the factors of production, and in which the price level varies inversely with the efficiency of the factors of production. In such a monetary system, the quantity of money in the community would

³ A. C. Pigou, *Industrial Fluctuations*, p. 257.

⁴ R. G. Hawtrey, *Currency and Credit*, p. 451. To the extent that consumers’ outlay differed from consumers’ income, a disturbing force would be set up within a monetary system that stabilized consumers’ income. For this reason Hawtrey prefers stabilization of consumers’ outlay rather than consumers’ income. Cf. J. M. Clark: “To gain perfection we should have to create a standard that would run in terms of human efforts rather than in terms of mere commodities.” *American Economic Review*, 1913, p. 576.

remain fixed if there were no change in the income velocity of money and in the volume of the factors of production. An increase in the quantity of labor, land, or capital would require some increase in the quantity of money and in the total money income of the community.

However desirable it would be to stabilize the average money incomes, it is questionable whether stabilization of this kind is practicable. With the growth of large scale production and the use of large quantities of capital, the real income of the community will increase; but the share of the working class in this larger real income will tend to decrease. "An enlargement of the leisure class and a diminution of the proportion of income going to the laborers are the natural concomitants of material progress under the system of private property."⁵ Stabilization of the average money income of the community will require lower money wages for labor and lower money earnings for business men. It is unlikely that the working class would accept as satisfactory a monetary system in which its money earnings would fall, despite increasing efficiency, altho the absolute level of real wages would rise with the fall in prices. And as business men are also affected by the money illusion, it is possible that the fall in money earnings of business men would act as a restraint on enterprise. There is no reason why stabilization of the money income of the community should lead to business deflation and under-employment; but it is likely that with the existing wages and profits system it would have this effect.

In view of the difficulty of stabilizing the average money income of the community, it has been proposed that the monetary system and the price level be managed so that a constant money rate of wages would always be the equilib-

⁵ F. W. Taussig, *Principles of Economics*, II, 222.

rium rate of real wages. Those who prefer this type of stabilization generally hold the view that rigidity in money rates of wages are an important cause of variations in business activity. It has been further urged in favor of this proposal that it would facilitate the making of long-term contracts between employers and labor unions, thus minimizing industrial strife, for laborers would then be assured that without adjustment in their wages contract, they would share in the general progress of society.⁶

The objections already made to the stabilization of average money income are also applicable to the stabilization of money rates of wages, altho not quite to the same extent. So long as labor is affected by the money illusion, a constant money rate of wages, altho with falling prices actually a rising rate of real wages, would make labor feel that it is not sharing in the economic progress of the community. And this feeling would be strengthened by the knowledge that the money incomes of capitalists and landlords were rising while money wages remain constant. Stabilization of the average money rate of wages would also require a fall in the wages of any class of labor whose value fell relative to other labor. Nor would stabilization of the money rate of wages

⁶ This argument was advanced by Dr. Maurice Leven of the New York State Housing Commission, in favor of stabilization of hourly rates of wages. It is discussed by Professor W. I. King, *Journal of the American Statistical Association*, March, 1928, Supplement, pp. 146-147. A similar proposal is that of Monroe that the standard of value should be the most plentiful labor of the community, working without capital and in such a relation to the land supply that land yields no rent. This he calls the basic labor standard. If the money rate of wages of basic labor should be stabilized, the total money income of the community would vary with the supply of productive resources, other factors of production being converted into basic labor according to their value. A. E. Monroe, "The Standard of Value," *Quarterly Journal of Economics*, February, 1932. The view that labor is a particularly good measure of value has long been common in economic theory. Cf. A. Smith, *Wealth of Nations*, Bk. I, chap. V.

eliminate industrial strife. Rather, it would transfer the struggle from the field of wages to the field of prices; for, it may be assumed that under such conditions labor would direct its efforts toward securing a fall in the price level, while employers would direct their efforts toward securing a rise in the price level. If wage rates were completely rigid, stabilization of money wages would be the ideal method of maintaining economic equilibrium. But it is not a practicable proposal under existing conditions; for it takes no account of the spontaneous tendency for the money rates of remuneration for human effort to rise slowly but steadily.

Still another proposal is to manage the monetary system and the price level in such a manner that a fixed nominal rate of interest would always be the equilibrium rate of real interest. This is a natural consequence of the view that failure to maintain the proper rate of interest is the chief cause of variations in industrial activity. While there is merit in this proposal, it is also open to serious objections. The long time tendency is for the rate of real interest to fall. It follows that if the nominal rate of interest were stabilized, the maintenance of economic equilibrium would generally require rising prices, rising money wages and other money rates of remuneration. Under such conditions, with the prevailing tendency for money wages to lag, stabilization of the nominal rate of interest would generally induce a condition of inflation. Another objection to this proposal is that the equilibrium rate of real interest sometimes varies upward as well as downward, so that at times prices would have to be lowered to maintain economic equilibrium. Under such conditions, if money rates of wages should not fall promptly, there would be a tendency for a condition of deflation to develop.

4. *Justice to Debtors and Creditors*

There is no demonstrable superiority in one form of stabilization rather than another. All that can be expected of the best managed monetary system is that it will maintain economic equilibrium. This can be done by maintaining equality of the expense level and the price level. As already indicated, economic equilibrium requires that the real rate of remuneration for a unit of productive *effort* should vary with productivity, so that the equilibrium real rate of remuneration for a unit of productive *efficiency* is always constant. An increase in the productivity of the community increases its real income and the equilibrium real rates of remuneration for the factors of production. Provided this increased real income is distributed among the factors of production on the basis of their economic worth, it is a matter of indifference whether increases in the real rates of remuneration are brought about by changes in money income or in the price level of goods. It is desirable, of course, that business men and laborers, borrowers and lenders, should know and act on the basis of the form of stabilization by which equilibrium is to be maintained.

The first purpose of stabilization is the full but not excessive employment of the factors of production; and this can be accomplished only if the real rates of remuneration are maintained constantly at the equilibrium level. It is undoubtedly possible, by appropriate variations of the price level, to induce higher or lower real rates of remuneration than equilibrium rates; but such manipulation of real incomes will be reflected in changes in the demand for the factors of production. In a society of free enterprise, where production is undertaken for profit, it is generally not desirable to use the price level for the purpose of increasing the

share of one factor rather than another in the national income. Reform in the distribution of the joint product of the community must be sought on another basis, for it cannot be achieved by manipulating prices or expenses without disturbing economic equilibrium and without affecting the volume of employment for the factors of production.

It is often said that there is advantage or disadvantage for one group or another in the choice of a standard for stabilization. Particularly, much has been written of the gains or losses to the debtor and creditor classes in the choice of stable prices or stable incomes.⁷ Briefly, it is argued by those favoring stabilization of prices, that if money incomes are fixed and the price level moves downward, the creditor class will gain at the expenses of debtors, and that in this there is an unjust burden upon debtors and an undeserved windfall for creditors. On the other hand, it is argued by those favoring stabilization of incomes, that there is no good reason why creditors should not share in the gains of progress as evidenced by the increasing productivity of the community and by the fall in the price level. Altho with falling prices, the quantity of goods received by the creditors in payment of the interest and principal of their loans is larger than it would be with stable prices, the debtors earn more and there is no greater difficulty in paying the larger real sums. To an argument of this sort there can be no satisfactory conclusion. It is futile to seek a standard of justice for debtors and creditors in the repayment of a fixed quantity of goods or a fixed quantity of productive effort.

It is nevertheless of great importance to the community that the real rate of interest should be properly determined.

⁷ See, for instance, F. A. Bradford, "Some Aspects of the Stable Money Question," *Quarterly Journal of Economics*, August, 1929. See also, A. H. Hansen, *Economic Stabilization in an Unbalanced World*, chap. XIX.

The proper real rate of interest is that which induces lenders to provide the community with a sufficient quantity of savings, and induces borrowers to undertake sufficient capital developments, to continue the technical progress in production for which the community is prepared. If the real rate of interest is too low, the community will find that it does not have sufficient savings for its capital needs; and conversely, if the real rate of interest is too high, the community will find that the available supply of savings is excessive and is not utilized in the production of investment goods. For this reason it is essential to the well-being of the community that the proper real rate of interest should always prevail. In general, if sufficient knowledge of the probable movement of the price level is available to borrowers and lenders, they may be expected to adjust the nominal rate of interest to offset the expected movement in prices. Under the circumstances, the importance of maintaining the proper real rate of interest is not fundamentally a question of doing justice to debtors and creditors, but of securing the best utilization of the national income in consumption and in investment.

In the payment of interest and principal of loans under changing economic conditions, it would seem that if debtors pay and creditors receive that remuneration for which they would have contracted if they could have foreseen the changes, no injustice is done. The rate at which lenders supply and borrowers demand present goods in exchange for future goods is to some extent determined by the present and prospective incomes of lenders and borrowers. If with the advance in productive efficiency, the incomes of members of the community are increased more than was contemplated, debtors and creditors, if they could have foreseen the unexpected rise in incomes, would have contracted

for a higher rate of real interest. Under such circumstances, there is no injustice done to debtors if creditors are given part of the benefit of the unexpectedly larger income of the community. It is probably a situation of this kind that Pigou has in mind when he suggests that the increased income of interest receivers, when prices fall with increased productivity, is not wholly without warrant.⁸ In practice, however, the question of justice between debtors and creditors cannot be resolved.

Whatever may be said of the importance of assuring to prospective lenders the proper rate of real interest on the ground that at any other rate the division of the national income between present and future uses would not conform to the needs of society, the same reasoning cannot be applied to loans already made and long outstanding. Presumably, the funds already lent would not be affected to any great extent by the basis chosen for future stabilization. For this reason, Keynes holds that it would be desirable to stabilize prices rather than incomes, so that with the progress of society, the share in the national income received by bondholders would diminish. "I think it desirable," he writes, "that obligations arising out of past borrowing, of which National Debts are the most important, should, as time goes on, gradually command less and less of human effort and of the results of human effort; that the dead hand should not be allowed to grasp the fruits of improvements made long after the live body which once directed it has passed away."⁹ Altho the prin-

⁸ A. C. Pigou, *Industrial Fluctuations*, p. 256.

⁹ J. M. Keynes, *A Treatise on Money*, II, 393-394. Keynes takes note of the effect of expected changes in prices on the contracted rate of interest. "Even if the movement were fully foreseen and fully allowed for in the rate of interest obtained by lenders, no harm would be done;—it would merely mean that the current yield on long-term securities would

cial beneficiaries of a reduction in the share of the national income going to bondholders will be shareholders, themselves not always an active group in the management of business, there is much that is attractive in reserving a larger share of the future income of the community for the active producing classes and a smaller share for the passive owning classes.

5. *A Stabilization Policy*

If stabilization could be undertaken with the assurance that nothing in the economic system would defeat its purpose, the stabilization of money incomes would be the most effective means of maintaining economic equilibrium. Under the prevailing wages and profits system, with the tendency of working men and business men to regard money income, rather than real income, as the test of their economic well-being, the stabilization of money incomes would not assure the maintenance of economic equilibrium. The proper basis for stabilization must take into account not only the rigidity in money rates of remuneration and their unresponsiveness to changes in demand; but also their long-time tendency to rise, particularly with increases in the efficiency of the factors of production. Under these complex conditions, a monetary system designed to maintain economic equilibrium cannot be managed successfully by stabilizing prices or stabilizing incomes; it must be managed so that movements in the price level balance corresponding movements in the expense level. It is probable that such management of the monetary system would involve the maintenance of a price level that does not ordinarily rise, and a level of money wages and money profits that does not ordinarily fall. How much prices will be permitted to fall, and how much incomes will be

include a small element of sinking fund to pay off the capital sum." And this he regards as desirable.

permitted to rise, must depend on the economic customs and conditions of the community.

The proper basis for stabilization will vary in every community, depending on the tendency for rates of remuneration to respond to changes in the demand for the factors of production—that is, on the degree of rigidity in the expense level. In a society in which the tendency is for the money rates of remuneration for a unit of productive effort to remain constant—that is, for money earnings to be relatively fixed—the monetary system must be managed to bring about a variation in the price level inversely with the variation in productive efficiency. On the other hand, in a society in which the tendency is for money rates of remuneration for a unit of productive efficiency to remain constant—that is, for money earnings to vary with productivity—the monetary system must be managed to maintain stable prices. Only in this way can alternate over- and under-employment of the factors of production be avoided.¹⁰

In this country, the tendency is for money rates of remuneration to vary to some extent with changes in efficiency and

¹⁰ Obviously, in a society not organized for profit, the appropriate type of monetary management would be determined by other considerations than the maintenance of equality of the price level and the expense level. In a socialist society, the most important monetary problem would be to secure the proper division of the national income between present consumption and investment. In a socialist society, investment would be undertaken exclusively by the state; and it would take the form of using some of the factors of production in making investment goods. The appropriate price level under such conditions would be that which equates the outlay on consumption goods and the money earnings of the community. This could be done by varying prices inversely in proportion to the volume of the factors of production devoted to making consumption goods, while maintaining money earnings constant; or by varying money income in proportion to the volume of the factors of production devoted to making consumption goods, while maintaining prices constant. In all probability, human nature being what it is in a socialist as well as in a capitalist society, some variation in prices and some variation in incomes would be permitted.

with changes in the demand for the factors of production. The maintenance of economic equilibrium in this country is therefore more likely to be promoted by a policy of stabilizing prices than by a policy of stabilizing incomes. It is also likely that the economic thinking of the people of the United States is better adapted for maintaining equilibrium with comparatively stable prices and variable incomes, than with variable prices and comparatively stable incomes. That is not to say that absolute stability of the price level is necessary or desirable. On the contrary, if economic equilibrium is to be maintained some variability of the price level must be permitted to offset the remaining rigidity in the expense level. For these reasons, approximate and not complete stability of the price level should be the immediate object of monetary management in this country.

In determining the best price level for approximate stabilization, it is important to choose a collection of goods that does not induce inflation or deflation thru changes in the prices of particular classes of commodities in the collection. For this reason stabilization of the international price level must be rejected as a means of maintaining economic equilibrium. If the international price level were stabilized, a rise in the prices of import goods would necessitate a corresponding fall in the prices of export goods. As all domestic prices tend to move together, a fall in the price level of export goods would induce a deflation. To a lesser extent the same objection can be made to the stabilization of the wholesale price level of all goods. Not only would a rise in the prices of import goods necessitate a fall in the prices of domestic goods, but a rise in the prices of agricultural goods would require a corresponding fall in the prices of industrial goods. As the value of agricultural goods is particularly

subject to change—because of great variations in crops—there would always be the danger of inflation or deflation induced by large or small crops. The price level best suited for approximate stabilization is the price level of domestically produced industrial goods. The great variations in employment induced by price movements are almost entirely confined to industrial production; and maintaining economic equilibrium is largely a matter of eliminating industrial fluctuations. The stabilization of this price level would not be prejudicial to agricultural interests, for the value of agricultural products in terms of industrial products would not be affected adversely. On the contrary, elimination of industrial fluctuations would minimize those variations in the prices of agricultural raw materials of production brought about by alternate periods of industrial prosperity and industrial depression.

Altho stabilization of the price level is not the ideal type of monetary management for maintaining economic equilibrium, it offers several advantages. First, stabilization of prices as an objective standard is more definite and better known than stabilization of incomes, or equalization of the price level and the expense level. It is entirely probable that the administrative difficulties of maintaining economic equilibrium would be minimized if the immediate object of monetary management were the stabilization of the price level. Second, tendencies toward inflation and deflation would be quickly and easily detected if the price level were stabilized. It has already been said that when the real rates of remuneration of the factors of production are not in equilibrium, they tend to induce price movements. A condition of inflation or deflation manifests itself in a small but sharp rise or fall in prices. For this reason the monetary system could be

managed more easily, if not perfectly, to maintain economic equilibrium by approximate stabilization of the wholesale price level of domestically produced industrial goods.

There is a further reason of great importance for accepting stabilization of prices as a satisfactory immediate object of monetary management. In recent months the community has become familiar with this object of monetary management; and the administration has on several occasions indicated that its policy is stabilization of the price level. In a message to the London Economic Conference, July 3, 1933, President Roosevelt said: "Let me be frank in saying that the United States seeks the kind of dollar which a generation hence will have the same purchasing power and debt-paying power as the dollar value we hope to attain in the near future." And in a radio address on October 22, 1933, the President stated that monetary management was the policy of his administration, and that stabilization of the price level was his ultimate object.

It should be particularly noted that minimizing fluctuations of the price level can be only the immediate object of monetary management. The ultimate object of monetary management must be the maintenance of economic equilibrium. Whatever the immediate price level policy of the monetary authorities may be, it must always be subordinate to the fundamental policy of maintaining the full and proper employment of the factors of production, of distributing the national income among the co-operating factors of production on the basis of equilibrium real rates of remuneration, and of utilizing the national income in consumption and investment to provide for the present needs and the future progress of the community.

Chapter XIX

Plans for Monetary Management

1. *Multiple Standards*

THE great variations in prices in all periods of history, and the evils that arise from them, have led economists and statesmen to seek monetary standards that would be more stable in value. Many proposals have been made to substitute for gold and silver some other means of paying obligations contracted for long periods. Locke suggested that "wheat in this part of the world, and that grain which is the constant general food of any country, is the fittest measure to judge of the altered value of things, in any long tract of time;" and many economists since Locke have held the same view.¹ The desirability of using wheat as a measure of value is evidently based on the assumption that a large part of the income of the representative person is expended on wheat. As expenditure becomes diversified, and many commodities each in small part become the real income of the representative person, wheat no longer remains a satisfactory measure of value. For this reason later proposals have sought to determine a just basis for long time obligations by reference to many commodities, that is, to establish a multiple standard of value.

The proposals for a multiple or tabular standard generally provides that debts, rents, wages and other obligations ex-

¹ Cited by F. A. Walker, *Money*, p. 159. Cf. A. Smith, *Wealth of Nations*, Bk. I, chap. V; and A. Marshall, *Money, Credit and Commerce*, p. 54.

tending over long periods be paid with a variable sum of money, directly proportional to changes in the price level. Thus, if the price level should rise by 20 per cent between the time a debt was incurred and the time it was repaid, it would be necessary to pay \$120 for every \$100 borrowed to discharge the obligation; and conversely, if the price level should fall by 20 per cent, a payment of \$80 for every \$100 borrowed would discharge the obligation. Contracts would thus specify the payment of a stated quantity of purchasing power rather than money. A plan of this sort was used in Massachusetts in 1747 and in 1780, during periods of extreme depreciation of money; and similar proposals were later made in England on many occasions, altho never put into practice.² The plan aroused much discussion when it was approved by Jevons in his book on money. Altho it would introduce complexity into the relations of debtors and creditors, Jevons believed the difficulties were not considerable.³

A similar proposal was made by Marshall in 1887. A government department could ascertain the prices of all important commodities, and publish from time to time the amount of money required to give the same purchasing power as £1 at some basic date. This quantity of purchasing power Marshall called a *unit*. Loans could be made in terms of either money or units. If loans were made in units, "the borrower would not be at one time impatient to start ill-considered enterprises in order to gain by the expected rise in general prices, and at another afraid of borrowing for legitimate business for fear of being caught by a general fall

² W. Fisher, "The Tabular Standard in Massachusetts," *Quarterly Journal of Economics*, May, 1913. The Rand Kardex Company in 1925 issued "seven per cent thirty-year stabilized debenture bonds, registered and safeguarded as to purchasing power of both principal and interest." For the text, see *Stabilization Hearings*, 1927, pp. 58-61.

³ W. S. Jevons, *Money and the Mechanism of Exchange*, pp. 330-331.

in prices." Not only loans, but ground rents, taxes, and salaries and wages could be stated in terms of units. For special purposes, special units could be constructed, to give greater weight to particular commodities, such as farm products.⁴

In favor of the tabular standard it can be said that it would provide a means of securing stability in purchasing power in long term contracts; and that it would cause no forced disturbance in existing contracts, as would result from a change in the monetary standard. The general objections to the tabular standard were stated by Bagehot as long ago as 1875. He held that it would be disturbing to international trade; that it would make banking difficult, if not impossible, because bank liabilities would be expressed in terms of money and some bank assets would be expressed in terms of units; that it would be difficult to secure a satisfactory index number of prices because the quality of commodities differs from time to time and place to place; and that it would be undesirable to separate the standard of value from actual money.⁵ These objections cannot be regarded as conclusive, for it is generally assumed that the tabular standard would be used only by agreement. A more serious objection is that the use of the tabular standard would not provide a short period monetary unit of stable purchasing power, and that it would not eliminate variations in business activity. As an ultimate plan for monetary reform the tabular standard must be considered unsatisfactory. Nevertheless, until a broader policy is adopted, there is every reason to encourage the use of the tabular standard.

Strictly speaking, the plans of Jevons and Marshall do not

⁴ *Memorials of Alfred Marshall*, p. 198; *Official Papers*, pp. 11-13.

⁵ Originally printed in *The Economist* (London), November 20, 1875; reprinted in *Economic Journal*, 1892, pp. 472-477.

provide for a monetary system based on a multiple standard, but for a multiple standard applied to some payments under the prevailing monetary system. More recently, Professor Lewis has proposed a plan for establishing a monetary system based on a unit convertible into a fixed quantity of each of four standard commodities—wheat, cotton, iron and silver. Anyone possessing a note for a unit of money could present it at a government office and exchange it for four warrants calling for a specified quantity of wheat, of cotton, of iron and of silver. The value of the four warrants together would always be equal to a constant sum of money, altho the value of each warrant would vary with the value of the commodity for which it calls. The goods to which the warrants are a claim could be stored in warehouses, and actual delivery could be secured by those who want possession of the goods. If the same plan were adopted by many countries, all using the same relative quantities of the four commodities, stability of the exchanges would also be secured.⁶

The plan bears some resemblance to Marshall's symmetallism adapted to a larger group. Altho ingenious, it cannot be regarded as a satisfactory basis for monetary reform. However stable a monetary unit of this sort would be over long periods, it is certain to be unstable during short periods. The supply of two of the basic commodities, cotton and wheat, is largely dependent on weather conditions; and the great variation in their production and value would bring about large changes in the value of money. Lawrence compared the stability of value of gold and of a combined standard of cotton, wheat and pig iron over a period of many

⁶ G. N. Lewis, "A Plan for Stabilizing Prices," *Economic Journal*, March, 1925. A similar proposal made in the last century is cited by F. A. Walker, *Money*, p. 160. "Count Soden, Roscher, and Schaffle have rightly recommended Mixed Rents, reckoned by the values of the precious metals, breadstuffs and cloths."

years, and found that the average annual variations in value were greater for the combined standard than for gold.⁷ A criticism occasionally made of symmetallism is particularly applicable to the four-commodity standard. The use of several commodities jointly as money so relates their values that instability in the value of one commodity gives rise to instability in the values of the others. Thus, the prosperity of a large and important industry would be subject to great variations if it were chosen as one of four commodities for a composite monetary standard. In the case of the iron industry, this would be particularly undesirable, because variations in the price of iron would give rise to greater variations in the prices of capital goods and in the volume of investment.

2. *Managed Gold Standards*

In recent years, a large number of plans have been proposed requiring no change in the accepted gold standard, but adding to it a degree of management not hitherto attempted, which would minimize large variations in the value of money. The plans for reforming the gold standard are of two types—those providing for the management of the supply of gold, by controlling the production of the mines to the extent needed to maintain a relatively stable value of gold; and those providing for the management of the monetary demand for gold to prevent large and sudden changes in its value.

The late Professor Lehfelddt of South Africa proposed that stability in the long period value of money could be secured by controlling the output of the gold mines. He suggested that a syndicate of the leading nations acquire the gold fields and the lands known to contain gold ore, and

⁷ J. S. Lawrence, *Stabilization of Prices*, pp. 206 ff.

operate them for the purpose of stabilizing the value of gold. Thus, if the price level should fall, the gold mines would be operated to the extent necessary to provide the world with sufficient gold to maintain stable prices; and if the price level should rise, gold would be withheld from the money markets until the value of gold was again at the chosen level. A syndicate of this sort operating the mines for the purpose of regulating the value of gold, and not for profit, could undoubtedly bring about greater stability in the long period value of gold. Obviously, it could not maintain stable prices in short periods but Lehfeltdt regarded that as a problem for central banks to be controlled by discount policy and by open market operations. If the leading nations of the world cannot be induced to join a syndicate of this sort, Lehfeltdt thought that joint action by the United States and the British Empire would be successful, for together they produce four-fifths of the world's output of gold.⁸

Control of the output would undoubtedly do much to stabilize the long period value of gold if unfavorable conditions did not develop. Nevertheless, it must be recognized that if the world's need for gold should increase to a great extent, it would be beyond the power of a syndicate to maintain output at a level high enough to stabilize the value of gold. Large and unprofitable production under such conditions would hasten the exhaustion of the mines without permanently stabilizing the value of gold. And it must also be recognized that if some country with a large gold supply, say, France or the United States, should permanently abandon the gold standard and offer its reserves to other countries, the value of gold could not be maintained, regardless of the restriction of output by a mine-owning syndicate.

⁸ R. A. Lehfeltdt, *Restoration of the World's Currencies*, pp. 56-60; *Stabilization Hearings*, 1927, pp. 1048-1049.

The cost of an enterprise of this kind must also be considered. It is questionable whether the gold lands of the world could be acquired at a cost of less than a thousand million dollars. It is even more questionable whether international co-operation could be secured for an enterprise of this kind.

Far more consideration has been given to the possibility of stabilizing the value of gold by controlling the demand for monetary purposes. R. G. Hawtrey was among the first to advocate the stabilization of the value of gold by control of the monetary demand. In 1919, he wrote: "If we are going to adhere to the gold standard in future, it is most desirable that the absorption of gold for currency purposes should everywhere be kept in control. . . We want so to regulate the demand for gold that the value . . . does not vary substantially."⁹ He proposed that the countries of the world should undertake to regulate the supply of their money so that the foreign exchanges are at the rate at which they are to be stabilized with reference to each other and to gold. Once attained, this equilibrium is to be preserved by the gold exchange standard. The redemption of domestic money in foreign exchange should bring about the retirement of the redeemed money. This in itself would be insufficient to assure stability if the central bank did not take steps to restore equilibrium thru restriction of credit. In this manner, by central bank management of credit and by international management of gold, stability in domestic prices and in the value of gold could be attained. Altho Hawtrey would have preferred an international agreement to control the demand for gold, he held that joint action by the United States and England was sufficient to assure a large degree of stability.

⁹ R. G. Hawtrey, *Monetary Reconstruction*, pp. 48, 50-54. Cf. G. Cassel, *Money and Foreign Exchange After 1914*, p. 263.

An attempt to secure international co-operation was made at the International Economic Conference in Genoa, in April, 1922. Resolutions were adopted calling for stabilization of prices thru a return to the gold standard. For this purpose central banks were urged to co-operate to maintain stability of exchange rates, and to prevent undue fluctuations in the purchasing power of gold. This could best be done, the resolutions stated, by establishing a gold exchange standard; each nation managing its monetary system to maintain gold parity, while the central banks acting together stabilized the value of gold. The recommendation for joint action to regulate the demand for gold reads:¹⁰

Resolution 9: These steps might by themselves suffice to establish a gold standard, but its successful maintenance would be materially promoted, not only by the proposed collaboration of central banks, but by an international convention to be adopted at a suitable time. The purpose of the convention would be to centralize and co-ordinate the demand for gold, and so to avoid those wide fluctuations in the purchasing power of gold which might otherwise result from the simultaneous and competitive efforts of a number of countries to secure metallic reserves. The convention should embody some means of economizing the use of gold by maintaining reserves in the form of foreign balances, such, for example, as the gold exchange standard or an international clearing system.

Despite this official recognition of the importance of managing the demand for gold, no specific action has been taken to comply with the resolutions. The Conference did bring about greater co-operation among central banks, altho not

¹⁰ The text of the Genoa Resolutions is given in full in *Stabilization Hearings*, 1927, pp. 957-958. Of these resolutions, Fisher said: "I regard the action taken at the Genoa Conference as the most outstanding of the many events . . . working in the direction of stabilization of prices." The Genoa Resolutions were never carried out.

as much as the resolutions called for. Credits were arranged for many European countries preparing to return to the gold standard. Discount rates in this country and abroad were determined with a view to managing the distribution of monetary gold between countries. And considerable consultation on policies took place among the central banks of England, France, Germany and the United States. At the World Economic and Monetary Conference in London, 1933, the Monetary and Financial Commission again recommended economy in the use of gold reserves, and consultation among central banks.

Keynes has long distinguished himself as the principal advocate of a national rather than an international monetary standard. Nevertheless, in his *Treatise on Money* he recognized that the tradition of an international standard is too strong to be disregarded; and that a struggle to establish an independent national standard would endanger the possibility of securing monetary stability of any kind. For this reason he urged a gold standard so regulated that the value of a unit of money in securing goods entering into international trade would remain substantially constant. This would require an international agreement of central banks upon the following principles of policy:¹¹

1. Cessation of the use of gold coin and certificates in circulation;
2. Maintenance by all central banks of balances with other central banks or with the Bank for International Settlements;
3. Elasticity in reserve requirements of central banks to permit international management unrestricted by the gold supply;
4. A margin of 2 per cent between the buying and selling price of gold by central banks, to facilitate local independence in the movement of short-term interest rates.

¹¹ J. M. Keynes, *A Treatise on Money*, II, 395-398.

If a larger degree of control could be agreed upon, Keynes would have a supernational bank, the Bank for International Settlements, accept deposits from and make advances to central banks. National money and deposits with the supernational bank would be exchangeable for each other on the same terms as gold, that is, a difference of 2 per cent between the buying and selling price. Deposits with the supernational bank would be regarded as reserves by central banks; and the supernational bank would make advances and engage in open market operations with a view to stabilizing the value of gold and business conditions.

In 1933, Keynes again advocated a policy similar to that already described; but providing an affective means of quickly raising the price level of commodities in terms of gold. He proposed that an international authority should be set up for the issue of gold notes to a maximum of \$5,000 million to be available to participating countries in exchange for an equal amount of their gold bonds bearing a low rate of interest. The quota for each country was to be equal to its gold reserve at the end of 1928, subject to a maximum of \$450 million for any one country, and with a provision for modification in exceptional instances. The participating countries were to undertake to pass legislation making the gold notes acceptable as the equivalent of gold, altho the notes were to be held exclusively by governments and central banks. The governing board of the international note issuing authority would be elected by the participating countries or their central banks, each having a voting power proportionate to its quota. The governing board would be permitted in its discretion to modify the volume of the note issue or the rate of interest on the bonds, with a view to

avoiding a rise in the gold price level of international goods above some agreed normal, say, the level of 1930.¹²

There can be no question that the value of gold can be stabilized to some extent by international management. On the whole, regulation from the side of demand is likely to be more effective than regulation from the side of supply, particularly as demand is subject to greater and more sudden variations than supply. Nevertheless, regulation of demand cannot permanently stabilize the value of gold, except at its cost of production, and this cannot remain constant. All that is possible is intermittent stability, with readjustment whenever the value of gold has departed so far from its cost of production as to be untenable. The gold exchange standard is also open to objections. There is always the danger that a country holding large foreign balances will upset stability in the value of gold by converting its holdings into gold at an inopportune time. The world has experienced this in the large absorption of gold by the Bank of France from 1929 to 1932. Nor is it likely that international co-operation can be secured for holding reserves in foreign centers, for the danger of great loss from depreciation of the gold value of foreign balances has been emphasized recently by the departure of England and the United States from the gold standard. There is little reason, therefore, for expecting that the value of gold will be stabilized by international action.

3. *The Compensated Dollar*

The plans for monetary reform already considered, except that of Lewis, involve no fundamental change in the accepted monetary system, for a unit of money would still

¹² J. M. Keynes, *The Means to Prosperity*, pp. 28-30.

be equal in value to a fixed weight of gold. Many economists have recognized that it is difficult, if not impossible, to stabilize the value of gold; and that a stable gold standard can be secured quickly and certainly only by adoption of the gold value standard. Since 1911, Professor Fisher has repeatedly urged that the present gold standard be converted into a gold value standard; so that a unit of money would be convertible into a fixed value rather than a fixed weight of gold. Thus, if prices rose and the value of gold fell, a unit of money would be redeemed with a larger quantity of gold having the same value; and conversely, if prices fell and the value of gold rose, a unit of money would be redeemed with a smaller quantity of gold having the same value. However the value of gold varied, the value of a unit of money, altho redeemable in gold, would remain constant.

As Fisher states, the proposal for a gold value standard is not original with him, altho he has perfected the plan and has familiarized the world with the importance of monetary reform along these lines. The proposal for a monetary unit equal to a constant value of the precious metals was first made by John Rooke, a Scotsman, in 1824. The first American to propose this plan was Simon Newcomb, in 1879. In 1887, Alfred Marshall suggested a similar proposal, combined with his symmetallism, for maintaining stability in prices. The proposal for a gold value standard was again made in the *Economic Journal*, in 1892, by Aneurin Williams, a British industrialist and member of Parliament. The essence of his proposal is found in the following statements:¹³

¹³ A. Williams, "A Fixed Value of Bullion Standard—A Proposal for Preventing General Fluctuations of Trade," *Economic Journal*, 1892, pp. 280-289. The plans of Rooke and Newcomb are given by I. Fisher, *Stabilizing the Dollar*, p. 293. Marshall proposed "a convertible currency, each £1 note giving the right to demand at a Government Office as much gold as at that time had the value of half a unit [of purchasing power], together

Clearly if we could by magic increase the weight of gold in a sovereign just in proportion as the purchasing power of a single grain of gold decreased, and decrease the weight just as the purchasing power of the grain increased, we should keep the total purchasing power of the sovereign constant.

If gold appreciated, the number of grains given or taken for a unit of paper money would be reduced: the mint price of gold bullion raised. If gold depreciated, the number of grains given or taken for a unit of paper money would be increased: the mint price of gold bullion lowered. Why then should not this system, which for shortness I will call the "value system," be adopted, and the standard of value effectually regulated?

Altho Giffen wrote a paper criticizing the proposal, little was heard of it until it was elaborated by Fisher.

No plan for monetary management has been given such thoro consideration or has secured such wide approval as that of Fisher. His proposal for a compensated dollar was made in *The Purchasing Power of Money*, published in 1911. On later occasions he modified the plan somewhat, altho its essential features have remained unchanged.¹⁴ In Fisher's plan the use of gold coins would be abolished entirely, and money would be in the form of notes redeemable in gold of varying weight but of constant value. The essence of a gold standard, the free purchase and sale of gold by government, would be retained. Every month, or a similar adjustment period, a government agency would calculate an index number of prices for a collection of goods. On the

with as much silver as had the value of half a unit." *Memorials of Alfred Marshall*, p. 207 n.

¹⁴ *Quarterly Journal of Economics*, 1913, pp. 213-235; *Economic Journal*, 1912, pp. 570-576; *American Economic Review*, Supplement, March, 1913; *Stabilizing the Dollar*.

basis of this index number the gold content of the dollar would be varied in precise proportion to the change in the price level, but not more than 1 or 2 per cent at any one time. To prevent speculation in gold, the difference between the government's selling and buying prices of gold would be equal to the maximum change in the gold content of a dollar in an adjustment period. Fisher recognizes that this method of compensating the gold weight of the dollar to eliminate changes in its value cannot maintain a constant price level; but he believes that it will limit variations to small changes about an established norm. The principal features of the Fisher plan were included in a bill introduced in the House of Representatives by Congressman T. A. Goldsborough of Maryland, on which no action was taken.¹⁵

Fisher holds that the success of his plan is not bound up with any particular theory of the value of money. He believes that the purchasing power of the dollar is to a large extent determined by its gold content. The bullionists, clearly enough, should have no difficulty in agreeing that a change in the gold content of the dollar must bring about a corresponding change in its value. Those who hold other theories of the value of money will not agree that the Fisher plan is so automatic as it seems; altho they may agree that it will be effective. Thus, if prices rise and the gold content of the dollar is increased, there will be a demand for gold for export; and the expenditure of the community on domes-

¹⁵ The hearings on the Goldsborough Bill are reported in *Stabilization Hearings*, 1927. The revised Goldsborough Bill, introduced in the 72nd Congress, provided that the Federal Reserve system should take all available steps to raise the deflated price level and thereafter to maintain a stable price level. For this purpose the Federal Reserve Board would be authorized to issue debentures if the security holdings of the Federal Reserve Banks should be exhausted, and to raise or lower the official price of gold if necessary to increase or decrease the gold reserves of the Federal Reserve Banks. *Stabilization Hearings*, 1932.

tically produced goods will decrease and with it the price level. Further, an increase in the gold content of the dollar will decrease the dollar value of the gold reserve, and will induce the banking system to diminish the volume of lawful money and deposits. This would require regulation of discount rates and open market operations by the central bank.¹⁶

The greatest objection to the compensated dollar is that it would interfere with international trade by upsetting the stability of the exchanges. If universally adopted, this objection would be removed. It is also argued that a rise in prices necessitating an increase in the gold content of the dollar would deplete the gold reserve; and that if redemption were demanded on a large scale, the government would incur great expense in maintaining convertibility. These objections indicate that the plan requires more complex management than Fisher assumed.¹⁷ Finally, it is objected that the plan takes no account of the prejudices and customs of the community.¹⁸ It is doubtful, however, whether the cus-

¹⁶ Hawtrey points out that if the compensated dollar were universally adopted, the effect on prices thru changes in foreign trade would be neutralized. It would remain true, of course, that changes in the dollar value of reserves by varying the rate at which credit can be created would sooner or later bring about an adjustment in prices. But this, says Hawtrey, could be done without changing the dollar value of gold reserves. *The Art of Central Banking*, pp. 192-193.

¹⁷ J. M. Clark, *American Economic Review*, 1913, pp. 576-578; A. C. Pigou, *Industrial Fluctuations*, pp. 292-293.

¹⁸ An extreme criticism of this sort is made by J. S. Lawrence, *Stabilization of Prices*, p. 109. "The unpardonable defect of this plan is its utter failure to allow for human nature. Men will not tolerate economic tyranny of this kind. Most men are perfectly willing to take their chances and demand from their government only the opportunity to exploit changing conditions as and when they arrive. No intelligent community will ever accept or retain this monetary bib and bottle or permit a maternally minded government to tie the members to its apron strings. This plan is conceived in an abysmal ignorance of human nature. It is founded upon fallacious premises of human infallibility, bureaucratic omniscience, and social docility."

toms of the community in the use of money offer a great obstacle to establishing the gold value standard; and the importance of stabilization is too great to permit cost to be a conclusive consideration. The only pertinent question is whether the Fisher plan would be effective. Professor Taussig, the most distinguished of Fisher's many critics, has said: "It must be admitted at the outset that the plan, if carried out with iron consistency for a considerable stretch of time, would achieve the result mainly had in view—the prevention of a long-continued and considerable rise in prices." ¹⁹

In 1923, Keynes advocated a plan somewhat resembling the gold value standard. He held that Fisher's plan was too slow acting, and faulty in that it sought to bring about a *correction* of price movements, whereas the better policy would be to *avoid* price movements. He also doubted whether Fisher's plan would prevent the short-period movements in prices associated with business cycles, altho he admitted that it would eliminate the long-period changes in the value of money. Keynes suggested that monetary management be directed to stabilization of the price level as shown by an index number of a collection of goods, modified from time to time to maintain its representative character. The monetary system would be managed by control of credit rather than thru gold. He would have the Treasury and the Bank of England undertake to regulate the monetary system to stabilize prices and business activity, the policy to be determined with reference to the index number of prices of the representative collection of goods, the state of employment and the volume of production, the demand for bank credit, interest rates, foreign trade and foreign ex-

¹⁹ F. W. Taussig, "The Plan for a Compensated Dollar," *Quarterly Journal of Economics*, 1913, pp. 402-416.

changes, and other relevant factors. The gold reserves would be used to avoid short-period fluctuations in exchange rates. The Bank of England would buy or sell gold at a varying price to be announced weekly, the price to be determined by changes in the price level, and by business conditions. A plan of this kind, Keynes held, would stabilize prices and production, and would bring about short-period stability in exchange rates, while permitting those variations in exchange that arise from changes in the real terms of trade.²⁰

There is one objection to all plans for a managed gold standard—whether for regulating the supply of or demand for gold, or the gold content of the monetary unit—that must be considered: that such devices are in fact an abandonment of the gold standard. This objection cannot be regarded as conclusive, but it minimizes the effectiveness of the argument that a managed gold standard is not a departure from the traditional monetary system of gold standard countries. On this question Dr. A. C. Miller of the Federal Reserve Board said: "A stable gold standard is something that the world has never known. . . . The moment you prescribe a stable gold standard you are in effect abandoning the gold standard and substituting in its place a dollar standard based on gold; and it is a dollar that is subject to other influences than those which affect the value of money under the unimpeded operation of the simple gold standard."²¹

4. *Regulation of Money and Credit*

At various times plans have been proposed for maintaining stable prices by automatic variation of the quantity of money to offset changes in prices. This could be done by the purchase or sale of securities, or by maintaining tax col-

²⁰ J. M. Keynes, *A Tract on Monetary Reform*, chap. V.

²¹ *Stabilization Hearings*, 1929, pp. 268-269.

lections above or below current needs, issuing additional money to provide for deficits and retiring excessive money from surpluses. In these plans, the convertibility of money into gold is not always retained. Such proposals have been made by distinguished economists, including Menger, Walras and Marshall. Menger proposed that the monetary system be dissociated from gold and silver, and that the value of the monetary unit be stabilized by issuing money in quantities so regulated as to neutralize the causes of fluctuations in prices as soon as they appear. Walras proposed that the value of money be stabilized by issuing or withdrawing silver coins (*billon regulateur*) to offset changes in the value of gold. This form of a managed limping gold standard would require international agreement to make it effective. Marshall suggested that an inconvertible paper currency could be stabilized if a government department would buy bonds with money whenever prices fell, and sell bonds for money whenever prices rose. Altho he offered this suggestion, Marshall did not advocate it.²² Of such plans, Professor Taussig writes: "A degree of stability in the value of money would be attained greater than that which, when long periods are considered, has been secured by the specie standard."²³

A novel plan for controlling the price level by regulating the expansion and contraction of the quantity of money has recently been proposed by Dr. Lauchlin Currie. He holds that perfect control of the price level requires that government issue of lawful money should be supplemented by government issue of all deposit money. For this purpose gov-

²² For Menger's plan, see I. Fisher, *Stabilizing the Dollar*, p. 291. For Walras's plan, see L. Walras, *Elements d'Economie Politique*, 2nd edition, pp. 477-485. For Marshall's plan, see *Memorials of Alfred Marshall*, p. 206 n.

²³ F. W. Taussig, *Principles of Economics*, I, 436.

ernment agencies could be set up whose sole duty would be to handle all the community's checking accounts. The quantity of deposit money could be increased by the purchase of government bonds, and could be decreased by the sale of government bonds by this agency. The existing banks would be permitted to accept savings deposits, but such savings deposits could not be drawn against by checks. Thus, the functions of creating deposit money and of making short term loans would be separated, the first being taken over by government, the second being retained by banks. For administrative purposes it might be desirable to utilize the existing banks as offices of the government agency to keep records of deposit balances and to cash checks. Against these deposit balances the banks would be required to keep a reserve of 100 per cent, including the small amount of lawful money held for cashing checks presented at the banks. There can be little question of the fundamental soundness of Currie's proposal; but its extreme departure from prevailing practice would increase the difficulty of controlling the price level by this means.²⁴

Carl Snyder of the Federal Reserve Bank of New York has proposed that the price level be stabilized by varying the volume of money thru the purchase and sale of securities, and thru raising and lowering the rediscount rates of the Federal Reserve Banks, as conditions require. Specifically, he proposed to put all gold now in the Treasury and in the Federal Reserve Banks in a common redemption fund to be used to maintain the convertibility of money. The gold reserve requirements of the Federal Reserve Act would be repealed, and the quantity of money would be managed with reference to an index number of prices, checked by other index num-

²⁴ L. Currie, *The Supply and Control of Money in the United States*, chap. XV.

bers of production, employment and trade. The automatic nature of the plan is indicated by the method provided for controlling the note issue.

Control of the note issue to be through the medium of the federal reserve banks, which should be required by law, on a change in the price level of, let us say 3 per cent (or whatever figure might be decided upon) to raise or lower the rate of rediscount by 1 per cent, or in the same way to raise or lower their holdings of securities and acceptances by, let us say, some conventional figure like 100 million dollars, as might be agreed upon; or both. The changes in the bank rate and security holdings might be at a mildly progressive rate as, for example, a change of 1 per cent in the rate for the first 3 per cent change in the price index, another 1 per cent for the next 2 points change in the price index, etc.²⁵

The object is to keep the amount of money in balance with the price level, and to maintain the latter at as nearly a constant figure as is practicable. Snyder adds that his investigations indicate that a high degree of stability could be attained quickly by these simple means.

In the first session of the 69th Congress, Representative J. G. Strong of Kansas introduced a bill to amend the powers and duties of the Federal Reserve Banks, to place greater emphasis on the stabilization of prices. The bill reads:²⁶

²⁵ C. Snyder, "The Stabilization of Gold: A Plan," *American Economic Review*, 1923, p. 284.

²⁶ The word "minimum" in the bill, second line, is a mistake. The amendment strikes from the law as it then was the words "and business," and adds: "and promoting a stable price level for commodities in general. All of the powers of the Federal Reserve System shall be used for promoting stability in the price level." H. R. 7895, 69th Congress, first session. The hearings on the bill are published in the government document, *Stabilization Hearings*, 1927.

A Bill to amend paragraph (d) of section 14 of the Federal Reserve Act, as amended, to provide for the stabilization of the price level for commodities in general.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that paragraph (d) of section 14 of the Federal Reserve Act, as amended, is amended to read as follows:

“(d) To establish from time to time, subject to review and determination of the Federal Reserve Board, a minimum rate of discount to be charged by such bank for each class of paper, which shall be made with a view to accommodating commerce and promoting a stable price level for commodities in general. All of the powers of the Federal Reserve System shall be used for promoting stability in the price level.”

The bill was not acted upon in Congress.

In the hearings, approval was given to the bill by many economists, among others by Professors Fisher and Rogers. They held that within limits the Federal Reserve Banks could control the price level by varying the amount of money and credit in the community. This could be done effectively only if the gold reserves were sufficiently large to permit the management of the monetary system without regard to variations in the gold reserves. Fisher emphasized the difficulty of continued stabilization thru open market operations and rediscount rates when gold reserves are insufficient. Under certain conditions, to carry out the provisions of the Strong Bill the Federal Reserve Banks would require supplementary means of varying the gold reserves, and for this purpose Fisher favored the compensated dollar as he proposed and as was embodied in the Goldsborough Bill. Rogers held substantially the same view. He believed that the Strong Bill provided the means for eliminating short

period fluctuations in the price level; and these were the fluctuations most disturbing to business stability.

The attitude of the officials of the Federal Reserve system was that the Federal Reserve Banks had little control over the price level, and that it would be beyond their power to stabilize prices to the extent contemplated in the bill. Governor Strong of the Federal Reserve Bank of New York agreed that to some extent, particularly during a period of rising prices, the Federal Reserve system could limit price movements. On the whole, he held, it had no power to halt a downward price movement. Dr. A. C. Miller of the Federal Reserve Board was even more skeptical. He said: "There is a strong temptation to exaggerate the influence that can be exercised upon the movement of business and the course of prices through the operations of the Federal Reserve system; through either its discount rates or open market operations." While admitting that the Federal Reserve system had to some extent stabilized the price level from 1922 to 1926, the Federal Reserve officials preferred not to have a definite mandate to use the facilities of the system to stabilize prices. Under any circumstances, they doubted the wisdom of guiding Federal Reserve policies by reference to an index number of prices.²⁷

Altho central banks can increase the volume of money and the reserves of the banking system by open market

²⁷ For these views, see *Stabilization Hearings*, 1927; *Fisher*, p. 70; *Rogers*, p. 219; *Strong*, p. 550; *Miller*, p. 837. The revised Strong Bill: "A Bill to amend the act approved December 23, 1913, known as the Federal Reserve Act; to define certain policies toward which the powers of the Federal Reserve system shall be directed; to further promote the maintenance of a stable gold standard; to promote the stability of commerce, industry, agriculture and employment; and to assist in realizing a more stable purchasing power of the dollar, and for other purposes," was introduced in the 70th Congress. The hearings on this bill are given in the government document, *Stabilization Hearings*, 1929.

operations and by a liberal rediscounting policy, they cannot induce business men to borrow funds to finance production, unless such investments are profitable. For this reason, suggestions have been made to influence the price level more directly. P. W. Martin proposes that a Purchasing Power Adjustment Board, independent of the government and the central bank, be established to offset an excess or deficiency of purchasing power in the economic system. The Board would have a program of public works that could be undertaken at a favorable time; and when a deficiency in purchasing power is revealed by unemployment, such public works could be let out to contractors to the extent necessary to restore equilibrium. To finance these works, the Board would borrow from commercial banks, at the same time arranging with the central bank to put sufficient reserves in the hands of member banks, by open market purchases, to form the basis for an increase in bank credit. Conversely, when an excess of purchasing power is revealed, the Board would offset this by using the proceeds of taxation or of a public loan to repay its debts to commercial banks, at the same time arranging with the central bank to withdraw sufficient reserves, by open market sales, to induce a decrease in bank credit. Thus, the Board would act to control the volume of investment and to maintain it at a proper level. The importance of this proposal is not that it would directly affect employment, but that by regulating the volume of investment it would maintain prices precisely at the remunerative level essential for full but not excessive employment of the factors of production.

The object of Martin's proposal is to maintain the highest possible level of productive activity without giving rise to price inflation. The action of the Purchasing Power Adjustment Board would be determined by movements in the un-

employment index, or by an index of the volume of production, and in the price index. While there would be no insistence on rigidly stable prices, a persistent rise or fall in prices would not be permitted. With experience, more sensitive and more useful indexes could be devised to guide the Board. If it is thought desirable to maintain the gold standard with monetary management of this kind, international action to regulate purchasing power would be necessary. The maintenance of the gold standard would require simultaneous action by similar boards in many important countries. There is no reason, however, why independent national action cannot be taken while a country is not on the gold standard.²⁸

²⁸ P. W. Martin, *Maintaining Purchasing Power*, chaps. XV and XVI. Cf. J. M. Keynes, *The Means to Prosperity*, pp. 3-24.

Chapter XX

A Monetary Program

1. *A National Monetary Authority*

IN 1892, the distinguished English economist, Robert Giffen, wrote: "No change in a monetary standard, if it is a tolerably good one, ought to be proposed or considered unless upon grounds of overwhelming necessity."¹ This is an acceptable basis for considering the desirability of monetary management. There is now, and there has been for a long time, an overwhelming necessity for a monetary system capable of bringing about the most satisfactory production, distribution and utilization of the national income under the existing organization of society. Some of our most urgent economic problems have their origin in a defective monetary system; and their solution requires a change in the long-accepted and traditional monetary standard. The experience of the past few years indicates definitely that a monetary system based upon a gold quantity standard, far from being a tolerably good one, is an intolerably bad one. Nor is there any reason for believing that the old gold standard is in any way suited to be the basis for an efficient monetary system. It is not and cannot be a satisfactory monetary standard.

The functioning of the monetary system of a complex industrial society cannot be permitted to depend on the chance forces determining the value of gold. Rather, the

¹ R. Giffen, "Fancy Monetary Standards," *Economic Journal*, 1892, p. 465.

monetary system must be managed to assure its proper functioning. This management must be directed toward securing stability in business—the full, but not excessive employment of the factors of production, and the distribution and utilization of the national income to maintain economic equilibrium. It is probable that stability in this sense can be secured to a large extent if the monetary system were managed with a view to minimizing variations in the price level of domestically produced industrial goods. A national monetary system of this kind, altho not indifferent to the monetary systems of other countries, must be independent of them. Thus, disturbing forces in other countries need not be permitted to affect the monetary system of this country; and disturbing forces in this country can be counteracted without reference to the effect upon the foreign exchange value of money. A well-managed monetary system must be national, not international.

It is commonly said that a national monetary system, dissociated from the monetary systems of other countries, would hamper international trade. Variations in rates of exchange are an additional cost in supplying goods in countries on different monetary standards. How great this cost will be depends on the variations in exchange and on the difficulty of eliminating or shifting the risk to exchange dealers. On the whole, it is probable that the increased cost is not large. It may be admitted that if a national monetary system had no repercussionary effect on production and income, there would be some slight tendency to diminish the volume of international trade. The effect of variable exchanges on international finance is much greater. In long period loans, a large change in exchange rates between the making of a loan and the repayment of principal is an important factor; and variable exchanges would undoubtedly diminish the volume of

international loans. The greatest effect of variable exchanges would be on short term loans. A change of as little as 1 per cent in exchange rates would entirely eliminate the interest on a three months loan at 4 per cent. However, the frequent shift of liquid funds to and from various financial centers has long been a factor dangerous to monetary stability, and its elimination must be regarded as a distinct advantage.

The effect of managed money on the volume of international trade cannot be determined solely from its relation to variable exchanges. A national standard that stabilizes the domestic price level and that avoids large variations in business activity is certain to increase international trade. The international trade of a country is dependent on the volume of production and the income and expenditure of the community. If the employment of the factors of production and their real income are maintained at a high level, there must be a correspondingly large expenditure on imports; and the exports of goods and services will be approximately equal to imports. Further, it is doubtful whether an international standard, altho maintaining exchange stability, is successful in securing as large a volume of international trade as the comparative costs of production of import and export goods would warrant. It is not too much to say that many of the restrictions on international trade, in the form of tariffs, import quotas and exchange restrictions, are devices by which countries seek to maintain fixed exchange rates without sacrificing stability in the domestic price level. If independent monetary systems were generally adopted, many such restrictions on international trade could be removed without fear of disturbing the monetary system; and exchange rates could be permitted to adjust themselves to the level that would bring about an equilibrium in the reciprocal demand for import and export goods. There can be no

question that this would involve a larger volume of international trade than is possible under unified monetary systems with fixed exchange rates.²

The hardships imposed on business men engaged in international trade by variable exchanges have in general been exaggerated. It is important to importers and exporters that they should know with certainty what future rights and obligations in foreign currencies will mean to them in domestic money; but there is no need that the value of such foreign rights and obligations should be invariable. The necessary certainty can be provided for all business men engaged in international trade by a well-organized market in future exchange.

Even if international trade were hampered somewhat by a national monetary system, this could not be regarded as a conclusive argument against management of the monetary system to provide stability in the price level of domestically produced industrial goods. The volume of monetary transactions involving foreign exchange in this country cannot be much more than 2 per cent of the total monetary transactions. It is obviously more important to assure stability in the 98 per cent of monetary transactions involving domestic trade than in the 2 per cent of monetary transactions involving international trade. The conclusion seems inevitable that a managed national standard, with stability of the price level,

² Professor W. I. King during the hearings on the revised Goldsborough Bill, 1932: "I do not believe that you can find a shred of evidence to show that the variation in the exchange rate hurts trade." *Stabilization Hearings*, 1932, p. 189. F. D. Graham and C. R. Whittlesey reach the same conclusion in their paper, "Exchange Rates, Foreign Trade, and Price Level," *American Economic Review*, September, 1934, especially pp. 407, 409-411. They conclude: "There is no consensus as to desiderata in price policy but it will be generally agreed that, in a conflict of stable exchange rates with the stabilization of prices, at a high level of general economic activity, it is the exchange stability which should be sacrificed." P. 412.

is preferable to an international standard with stability of exchange rates.³

The management of a national monetary system is a difficult undertaking; but the experience of Sweden, Great Britain and this country, in the past few years, is evidence that it can be done successfully. The first essential is to provide an agency for directing monetary policy, say, a National Monetary Authority. The work of the National Monetary Authority should be under the general direction of the President, on whom would devolve the ultimate responsibility for its functioning. The National Monetary Authority would require a number of experts in various fields, and competent statisticians. Complete management would involve control of three important monetary divisions: gold and foreign exchange, bank credit, and investment. Much of the authority required for effective control is already provided by the various emergency acts under which the monetary system of the country has been managed since March, 1933. The existing agencies of the government, such as the Federal Reserve system, the Reconstruction Finance Corporation, the Public Works Administration, and similar administrative bodies, could be utilized in carrying out the policies of the National Monetary Authority. Beyond question, a well-directed management of

³ It is sometimes argued that it is possible to secure stability of domestic prices with stability of exchange rates. Plans for this type of monetary management were considered in the last chapter. Such plans invariably require international agreement, which is not within the bounds of practical politics. Even so, it would not be possible to stabilize exchange rates and the price level of *domestically produced* goods; for every change in the reciprocal demand of countries for international goods requires a change in national price levels relative to each other. As Marshall wrote in 1887: "Every plan for regulating the supply of currency, so that its value shall be constant, must, I think, be national and not international." *Memorials of Alfred Marshall*, p. 206 n.

the monetary system by a permanent agency of government, such as the National Monetary Authority, could succeed in securing a large measure of stability in the price level of domestically produced industrial goods, and in minimizing variations in the employment of the factors of production.

2. Gold and Exchange Control

Altho exchange stability cannot be regarded as a primary object of monetary management, it would be desirable to have the gold and exchange control division of the National Monetary Authority minimize fluctuations in exchange rates, so far as this is consistent with maintaining stability in the domestic price level. At any time there is a rate of exchange that is normal with relation to the prices of import and export goods, and the reciprocal demand for these goods. It should be one object of monetary management to prevent exchange rates from deviating too far from this normal equilibrium. This could be done if the National Monetary Authority would undertake to buy or sell foreign exchange when rates have departed too far from equilibrium. When the National Monetary Authority is unable or disinclined to provide or accept foreign exchange, rates could be maintained at or near the equilibrium level by purchases or sales of gold. The object of the control exercised over the exchange market should not be to maintain rates above or below the equilibrium level; but to avoid unnecessary and too large variations of a temporary nature.

The effective management of the exchanges by the National Monetary Authority would require an exchange stabilization fund sufficiently large to give complete control of the exchange market. A fund approximately equal to one-half the annual imports of the country would probably be

sufficient for this purpose. The Gold Reserve Act of 1934 provides the Secretary of the Treasury with a fund of \$2,000 million for the purpose of minimizing exchange variations. The fund is established for two years, and may be extended for a third year on proclamation of the President. The nature of the operations authorized by the act is indicated by the provisions of Section 10 (a). "For the sole purpose of stabilizing the exchange value of the dollar, the Secretary of the Treasury, with the approval of the President, directly or through such agencies as he may designate, is authorized for the account of the fund established in this section, to deal in gold and foreign exchange and such other instruments of credit and securities as he may deem necessary to carry out the purpose of this section." There is sufficiently broad authority in this Act to permit control of exchange rates; and if management is not directed to attaining a rate too high or low relative to the equilibrium rate required by international trade conditions, the fund should be ample for its purpose. In controlling exchange rates, it is desirable that the National Monetary Authority should act thru established channels, for in this way its influence is likely to be most effective.

It may be objected that the National Monetary Authority has no place in the exchange market, and that the maintenance of equilibrium rates of exchange can be left to the free play of economic forces. This is to underestimate the magnitude of the forces involved, and the exchange functions of the government under the gold standard. At the time of marketing a large crop entering into international trade—say, cotton, tobacco or wheat—the demand for exchange in one direction may be so large that exchange dealers cannot supply the seasonal demands. Under the gold standard, the

government or the central bank provided gold that was used to secure exchange in foreign countries at a rate not far from the normal equilibrium. This was one of the great advantages of the gold standard. The control of the exchange market by the National Monetary Authority would provide similar supplies of exchange when seasonal requirements cannot be met by commercial dealers without too large a deviation from equilibrium rates of exchange. This is not a departure from, but an extension of, the ordinary practice under the gold standard.

One aspect of exchange control that would require the management of the National Monetary Authority is the establishment of a future exchange market. It has already been indicated that it is more important to business men to know at what rates they can buy or sell foreign exchange which they must pay or receive in their transactions, than to have these rates fixed. A future exchange market that would offset the future sales of exporters by the future purchases of importers would to a large extent eliminate the cost involved in variable exchange rates. Such a market will undoubtedly be developed by exchange dealers. It would be desirable, however, for the National Monetary Authority to supplement the exchange provided by ordinary dealers with its stabilization fund in order to minimize variations in future exchange rates, and to keep the future exchange market closely related to the current exchange market.

In a managed monetary system, gold should be used primarily as an auxiliary means of controlling exchange rates; and only incidentally as a device for directly influencing the price level. For this purpose it is important that the gold holdings of the country should be under the direction of the National Monetary Authority. The Gold Reserve Act of 1934 gives the government title to all gold in the posses-

sion of the Federal Reserve Banks in exchange for gold certificates not requiring redemption in a fixed weight of gold.⁴ The Secretary of the Treasury, with the approval of the President, may prescribe conditions "under which gold may be acquired and held, transported, melted or treated, imported, exported or earmarked." The Secretary of the Treasury may also buy or sell gold at rates advantageous to the public interest. With these powers, the National Monetary Authority may use the gold holdings of the country to complete its control over exchange rates. There are certain to be circumstances in which the National Monetary Authority will wish to maintain exchange rates while unwilling or unable to buy or sell foreign exchange for this purpose. The use of gold will assure the National Monetary Authority of control of the exchange market under these conditions.

The Gold Reserve Act of 1934 gives the President authority to determine the gold content of the dollar at any amount between 50 and 60 per cent of the gold content prior to 1933—that is, at not more than 13.932 grains nor less than 11.61 grains of fine gold to the dollar. There is thus a basis for the establishment of a gold value standard

⁴ Title to the gold should properly rest with the government, partly because the policy of the Federal Reserve Banks should be free from all doubt that it is in any way determined with reference to the possibility of profit from its gold holdings, partly because of the difficulties of making frequent adjustment of the government's profit or loss from changes in the dollar value of these gold holdings, and partly because an effective system of management requires complete control of the gold holdings by the National Monetary Authority. There is nothing contrary to established policy in taking from the Federal Reserve Banks the profits from a change in the gold value of the dollar. Prior to 1933, it was the established policy of the government under the Federal Reserve Act to limit the dividends of the system and to take for itself the excess profits. The taking of the profit from the change in the gold value of the dollar is an extension of this policy. It is also worth noting that a similar policy has been followed in all countries that have changed the gold value of their currencies.

of the type suggested by Fisher. On the whole, it would be desirable that a gold value standard should not be established. In the first place, the National Monetary Authority requires greater freedom in management than a gold value standard would permit. In the second place, if a gold value standard is established and must for some reason be suspended, the prestige of the National Monetary Authority would be diminished, and its control over exchange rates would become somewhat less complete. A managed gold standard is far more difficult to control than a managed free standard, and it can be no more effective in stabilizing the price level of domestically produced industrial goods. If after a period of successful monetary management, it is found that variability of the exchanges can be minimized by the gold value standard, it can then be undertaken. In the meantime, the purchase and sale of gold by the National Monetary Authority should not be mandatory.

3. Control of Bank Credit

The fundamental problem of management for a National Monetary Authority is the control of bank credit—that is, the creation and repayment of bank loans. It is largely in relation to the volume of deposit money and its variations that the income and expenditure of the community, and the price level of output, are determined; and unless the creation of deposit money is subject to control, successful management of the monetary system is impossible. The determination of a proper policy with regard to the making and repaying of bank loans must be the duty of the credit control division of the National Monetary Authority, while the carrying out of this policy should be left to the Federal Reserve Banks. No great change in the existing organization of the banking system is necessary for this purpose, for

the Federal Reserve Board can be converted without difficulty into the credit control division of the National Monetary Authority. It would be desirable, however, to give the Federal Reserve Board greater authority over the Federal Reserve Banks and over member banks.

To assure the National Monetary Authority complete control over bank credit, it must have greater facilities for regulating the operations of the banking system. The first step must be the inclusion of all commercial banks in the Federal Reserve system. This can be accomplished by making non-membership less attractive. The provision in the Banking Act of 1933 restricting membership in the Federal Deposit Insurance Corporation under the permanent plan to members of the Federal Reserve system can be used for this purpose. Perhaps the most effective means of inducing non-member banks to come into the Federal Reserve system would be to forbid member banks to make loans to or to accept deposits from non-member banks. If necessary, more extreme measures should be taken to secure universal Federal Reserve membership. In all probability, effective control of the banking system will require operations on a larger scale than the Federal Reserve Banks have hitherto undertaken. For this purpose it is essential that the Reserve Banks should hold a larger volume of assets. Additional funds can be secured by calling for the unpaid subscription of member banks on Federal Reserve Bank stock, and from the reserve deposits and stock subscriptions of newly included member banks. It should be noted that the provision in the Banking Act of 1933 that all earnings of Federal Reserve Banks in excess of dividend requirements be paid into surplus will eventually increase their assets to a considerable extent. It would be desirable, however, to give the Federal Reserve Banks authority to issue their own debentures, as proposed

in the Goldsborough Bill of 1932, whenever the open market operations of the Federal Reserve system exhaust the security holdings of the Federal Reserve Banks.

The means already in use must be retained as the basis for more extended control by the credit division of the National Monetary Authority. The establishment of a managed monetary system will undoubtedly increase the efficacy of persuasion. In itself, this indirect method of control can never be enough. It must be supplemented by the power of the Federal Reserve Banks to enforce their policies thru rediscount and open market operations. The Federal Reserve Banks would find their influence much increased by giving them authority to determine the acceptability of collateral offered by member banks for rediscounting on the basis of the compliance of borrowing banks with the general policies of the Federal Reserve Board. Such authority is already granted in part by the Banking Act of 1933, which provides that Federal Reserve Banks may refuse credit to member banks that use the rediscount facilities of the system to increase their loans for speculative purposes. Ultimately, the control of credit by the Federal Reserve system must depend on its ability to vary the reserves of member banks. To some extent, open market operations on a large scale can be effective; and the Federal Reserve Banks should hold sufficient assets to influence the reserves of member banks by this means. Under extreme conditions it may be necessary to vary reserve requirements directly. The Thomas amendment to the Agricultural Adjustment Act of 1933, already gives this power to the Federal Reserve Board, acting with the approval of the President, in time of emergency. It would be desirable to retain this provision as a part of the ordinary powers of the Federal Reserve Board, acting under the direction of the National Monetary Authority.

The difficulty of regulating the volume of bank credit by the ordinary means at the disposal of the Federal Reserve system has been demonstrated by recent experience. Undoubtedly, these same means supplemented by administrative regulation could be made effective. Under the Banking Act of 1933, the Federal Reserve Board has the power to regulate the interest rates paid by member banks on time deposits. The same act forbids the payment of interest on demand deposits except where required by state law. It would be desirable to give the Federal Reserve Board, acting for the National Monetary Authority, complete control over interest rates on all types of deposits. An important form of administrative control is the power to determine the discount rates charged by member banks on loans. The Banking Act of 1933 already provides a limit on the rates national banks may charge. It would be desirable to extend this regulation to all member banks, and to give the Federal Reserve Board the power to determine discount rates on bank loans.

Most important of all, the Federal Reserve Board should be given the power to determine the uses of bank credit and the volume of bank credit that member banks may make available. This could be done by providing for each member bank a variable loan and investment quota based on the average volume of reserves and on the capital and surplus of the bank. A provision of this kind is included in the Banking Act of 1933, authorizing the Federal Reserve Board to fix the ratio to capital and surplus of total member bank loans on stock market collateral. The power should be extended to include loans and investments of all kind. When the volume of credit that member banks are providing is excessive in the view of the National Monetary Authority, the Federal Reserve Board would reduce the loan and investment quotas of member banks. Thereafter, member banks would not be per-

mitted to make additional loans and investments until the total was reduced below their quotas. It may even be desirable to provide a minimum loan and investment quota for each member bank, the Federal Reserve Banks offering the necessary rediscount facilities for securing additional reserves, and the investment control division of the National Monetary Authority providing suitable investments. Such an extreme measure of control will probably not be necessary, altho it should be available for use.

If the various methods of control should be insufficient, it may be necessary to acquire direct control of the management of member banks. This could be done by placing directors on the member bank boards as representatives of the National Monetary Authority; or by actual ownership of member banks. A basis for such action already exists in the ownership of preferred stock and capital notes by the Reconstruction Finance Corporation. A simple plan for acquiring a controlling interest in member banks would be to require all member banks to subscribe 51 per cent of their capital to stock of the Federal Reserve Bank, paying their subscriptions with their own stock. The 49 per cent of member bank stock privately owned would be permitted to manage the bank; but if the management should not be in accordance with the policy of the National Monetary Authority, the Federal Reserve Bank could take control by virtue of its stock ownership. A banking system organized along such lines would offer many advantages in addition to the greater control exercised by the National Monetary Authority. It would provide greater stability for banks, more safety for depositors, and better directed bank management. The unity in the banking system would be exceedingly helpful during emergencies, for the interest of individual banks in the strength of the system would be greatly increased.

4. *Investment Control*

The means of control already considered are probably sufficient to permit the National Monetary Authority to manage the volume of credit to offset any tendency toward rising prices and business inflation. However, these means of control may be insufficient to permit the management of credit to offset falling prices and business deflation. For this reason, it may be necessary for the National Monetary Authority to take direct control of the volume of investment. The proposal to utilize public construction as a means of remedying depression has long been familiar. The report of a committee of the President's Conference on Unemployment in 1923 recommended the long-range planning of public works for this purpose. Similar proposals for transferring demand for labor from good to bad times have been made in other countries.⁵ In general, such proposals for regulating the construction of public works have been intended to provide a limited amount of employment during depression. It is only recently that economists have come to recognize the close relationship between investment and the price level; and the possibility of controlling the price level by appropriate variations in the volume of investment.

A comprehensive program of control by the National Monetary Authority must include regulation of investment. To a large extent sufficient control can be exercised by supervising the investment plans of governmental and quasi-governmental bodies. A division of the National Monetary Authority should undertake to unify the investment program of the federal government and its agencies, the state governments and their agencies, the counties, municipalities, school districts, park districts, sanitary districts, housing au-

⁵ *Business Cycles and Unemployment*, chap. XIV. A. C. Pigou, *Industrial Fluctuations*, Part II, chaps. XII, XIV and XVI.

thorities, port and bridge authorities, and similar bodies. A planned program of public works is not only useful in offsetting variations in the volume of private investment, but is also likely to prove a more efficient means of securing the capital equipment that governments require. So large is the investment of governmental agencies, that its control would probably be sufficient, under ordinary conditions, to prevent a large discrepancy between the volume of investment and the volume of saving. If it is found desirable to extend similar control over industries with a public interest, this can be done for railroads thru the Interstate Commerce Commission, and for local utilities thru the state Public Service Commissions.

The investment control division of the National Monetary Authority would obviously have no difficulty in securing the co-operation of the federal government and its agencies in planning their capital undertakings with a view to stabilizing prices and business conditions. To secure the co-operation of other governments and their agencies, it may be necessary to offer some inducement in the form of bounties to those that undertake approved projects at a time when the volume of investment is insufficient to maintain equilibrium. This may take the form of direct grants in aid, such as those given in the construction of interstate highways, or of providing funds at favorable interest rates. A combination of the two methods may be necessary, for in periods of depression some agencies cannot borrow except on extremely unfavorable terms, and a grant may be insufficient to induce them to undertake investment in advance of immediate needs; while other agencies may be able to borrow on such favorable terms under any conditions, that a grant may be required to induce them to undertake investment

in advance of immediate needs. The Public Works Administration has used these methods, offering governmental agencies a grant of 30 per cent, and providing the necessary funds at 4 per cent—considerably below the rate at which most of them can secure funds even in normal times. If it is desired to induce railroads and public utilities to plan their investment program in harmony with the policy of the National Monetary Authority, the funds could be provided thru the investment control division, much as the Reconstruction Finance Corporation has provided funds for railroads in the past few years. When conditions become favorable for raising funds in the securities market, railroads and public utilities could issue bonds and stocks for the purpose of repaying the investment control division.

Altho the funds to induce control of investment are to be provided by the National Monetary Authority, the funds for this purpose must be raised from the commercial banks. At a time of abnormally low demand for bank credit by private industry, banks are likely to be eager purchasers of the securities of the National Monetary Authority if these securities are made obligations of the federal government. To facilitate the provision of the necessary funds, the credit control division—that is, the Federal Reserve Board—would undertake open market operations and would reduce the rediscount rate to increase the reserves of member banks. As an extreme measure, the device of a loan and investment quota could be used to bring about a compulsory expansion of bank investments in the securities of the investment control division of the National Monetary Authority. The funds to be made available to railroads and public utilities could also be raised from commercial banks. For this purpose, securities of the borrowers could be used, or the investment

control division could act as endorsers, or if necessary, the obligations of the National Monetary Authority could be used directly.

It is probable that control of public investment will be sufficient to induce recovery in prices and production in periods of depression. There is no assurance, however, that this control is sufficient to prevent inflation thru excessive investment in periods of business prosperity. To secure more complete control of investment and its variations, it would be desirable to have some regulation of the capital undertakings of private enterprise. Such regulation could take the form of requiring a license from the investment control division of the National Monetary Authority for the public offering of securities. The registration now required under the Securities Act of 1933 could be extended to include the right to authorize or forbid the issue of securities not only on the basis of the soundness of the project, but also on the basis of its accordance with the requirements of monetary policy. Thus, in periods of rising prices, the National Monetary Authority could limit the issue of securities involving investment; and in periods of falling prices, the issue of such securities could be encouraged. Control of the capital market was exercised in all belligerent countries during the World War. The power to regulate the issue of securities should be granted to the National Monetary Authority; altho these powers would be used only if control of public investment is insufficient to prevent business inflation and deflation.

5. Some Objections Considered

The complexity of the problem of monetary management is indicated by the means required for effective control. Nevertheless, a National Monetary Authority, working thru the three control divisions of gold and exchange, credit, and

investment, could probably succeed in minimizing fluctuations in the price level of domestically produced industrial goods, and in maintaining the full but not excessive employment of the factors of production. The technique of management must be developed slowly, as experience indicates how effective the various means of control can be. To facilitate intelligent management, the National Monetary Authority would require information on prices, production, employment, wage rates and wage payments, interest rates, profits, bank loans and bank debits, security prices and issues, construction, inventories, and similar matters. With the development of economic forecasting, such information could be used to avoid the more extreme forms of disequilibrium, so that corrective measures would not be required on a large scale. As the tradition of monetary management becomes firmly established, the difficulties of the problem will be correspondingly diminished.

Much of the opposition to monetary management is based on the mistaken view that it would be a radical departure from established practice. In fact, the gold standard in all countries, and particularly in the English-speaking countries, has long been a managed gold standard. Whenever a country on the gold standard uses lawful money and deposit money rather than gold coins and gold certificates, the monetary authority must undertake some degree of management to assure the maintenance of equality in value of the various types of money with gold. The great change in policy is not in undertaking monetary management, but in converting management for the purpose of maintaining the equality of the value of money and gold, into management for the purpose of stabilizing prices and maintaining economic equilibrium.

There are many economists and business men who have

an aversion for what they call "fancy monetary standards." At best, it is an expression of a wholesome skepticism of ill-conceived and unnecessary changes in a satisfactory monetary system. At worst, it is a bar to monetary progress of any kind. The basis for such opposition is the doubt that the community is prepared to undertake management of its monetary system. Professor Hayek writes: "So long as we do not see more clearly about the most fundamental problems of monetary theory and so long as no agreement is reached on the essential theoretical questions, we are also not yet in a position drastically to reconstruct our monetary system, in particular to replace the existing semi-automatic gold standard by a more or less arbitrarily managed currency."⁶ Similarly, Professor Steiner holds that "banking and price knowledge and technique may hardly be deemed sufficiently perfected to be able to exercise adequate control."⁷ The present methods of control are undoubtedly inadequate for monetary management; but adequate methods of control can be provided. Similar doubt of the advisability of a managed monetary system is expressed by Lawrence. He adds: "It is highly dangerous to tamper with a force whose power you do not understand and cannot control."⁸ Such arguments against monetary management, while having a reasonable basis, are carried to extremes when used as reasons for perpetuating an unsatisfactory and undesirable monetary system. The possibilities of evils from mismanagement of the monetary system are great; but they cannot be greater than the prevailing evils of an unmanaged monetary system.⁹

⁶ F. A. Hayek, *Prices and Production*, p. 110.

⁷ W. H. Steiner, *Money and Banking*, p. 100.

⁸ J. S. Lawrence, *Stabilization of Prices*, p. 140.

⁹ A statement by Cassel is precisely to the point. "There are a number of people who, against all—even the most rationally conceived—schemes

There are some economists who favor monetary management and believe that it can be successful, but fear the dangers of mismanagement. "Human beings, even Americans," said the late Governor Strong of the Federal Reserve Bank of New York, "have not yet been elevated, intellectually or morally, to that godlike perfection of infallibility of wisdom and goodness as to stand the strain and perform the duties of such a position."¹⁰ Governor Strong exaggerated the dangers. It is inconceivable that the members of the National Monetary Authority would deliberately mismanage the monetary system for their private ends. The fear that is more common is that the government will at times encourage or compel mismanagement to suit its temporary needs. That governments may do this cannot be denied; but the same danger is present in any monetary system, for it is inherent in the relationship of government to money. In times of great national stress, the gold standard has not been a bar to government use of the monetary system to secure the real resources required for war or other purposes. No monetary standard can be established that is free of the danger of abuse. There may be a somewhat greater danger with a free standard than with a gold standard, for no change would be required in the monetary law. This could be minimized by legislation designed to prevent the abuse of the monetary system to secure for government the real resources for ordinary needs. Legislation fixing a maximum issue of lawful

for restoring normal . . . conditions, raise the objection that it is no use introducing artificial remedies, that developments must be allowed to take their course, and that time alone can repair the damage that has been done. It is a rather cheap kind of wisdom that finds expression in utterances of this sort." G. Cassel, *Money and Foreign Exchange After 1914*, p. 282. The greatest of all economic fallacies is the assumption that nothing can be done to remedy the evils of a society of free enterprise.

¹⁰ B. Strong, *Interpretations of Federal Reserve Policy*, p. 229.

money, and providing that the volume of lawful money may not be increased after the price level has risen by more than, say, 10 per cent without specific authority of the legislature, would prevent extreme abuses. Adequate safeguards can be provided for ordinary conditions; and under extraordinary conditions, safeguards are impossible and perhaps even undesirable.

Opposition to monetary management is possible from that group liberal in its outlook, that nevertheless opposes all modifications of the existing economic system on the ground that they are not designed to remedy the fundamental evils of a society of free enterprise, where production is undertaken for profit. For this reason they oppose a managed monetary system, holding that it may defeat what they regard as the greater end, a planned economic society. It is questionable whether successful monetary management must be a bar to the development of a planned economic society. On the contrary, monetary management is essential if a planned economic society is to be operated successfully. Similarly, there is a large conservative group that would be favorably inclined to monetary management, but fears that it may be the entering wedge of socialism. Opposition of this kind to monetary management is short sighted. The improvement of the monetary system, by increasing the efficiency of a society of free enterprise, may obviate a thoroughgoing control of all economic activity. The desirability of a policy of monetary management must be considered entirely outside the question of the most desirable form of economic society. There is no intention of suggesting that a managed monetary system can solve all the evils of the existing economic system. Undoubtedly, it cannot. But it can eliminate those evils arising from our faulty monetary system; and these evils are considerable.

Suggestions for Reading

General Books.

Bradford, F. A., *Money*. This short and relatively simple book is written in the conservative American tradition. Too little consideration is given to the problem of the value of money, and to the advisability of monetary management.

Cole, G. D. H., ed., *What Everybody Wants to Know about Money*. Nine Oxford economists contribute to a clear discussion of difficult questions of monetary theory and policy. The authors favor control of the monetary system, even to complete socialization of banking and investment.

Edie, L. D., *Money, Bank Credit and Prices*. Altho the author "does not depart from safe and conservative principles of monetary economics," he has written one of the best American books on money, with adequate consideration of the more important monetary problems.

Hawtrey, R. G., *Currency and Credit*. One of the foremost authorities on monetary questions makes a contribution of major importance to monetary theory in a concisely written book that no student of monetary economics should neglect reading.

Keynes, J. M., *A Treatise on Money*. A brilliant contemporary economist states his theory of the value of money in the most influential of recent books on the question. The author favors monetary management and regards the discount rate as an important instrument for this purpose.

Laughlin, J. L., *A New Exposition of Money, Credit and Prices*. The final views of an important American writer

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on monetary questions are presented in two large volumes. Altho useful for its historical treatment, the book gives almost no consideration to recent monetary theory. The conclusions are in complete disagreement with those presented here.

Robertson, D. H., *Money*. This is probably the best of the short books on money. Despite its brevity, consideration is given to all the fundamental monetary problems. It should be on the reading list of every person interested in economics.

Periodicals and Public Documents.

Statistical material on monetary questions, and discussions of current monetary problems and policies are frequently found in the following periodicals and public documents:

Federal Reserve Board, *Monthly Bulletin*; *Annual Reports*;
Federal Reserve Bank of New York, *Monthly Review of Credit and Business Conditions*;

Comptroller of the Currency, *Annual Reports*;

Director of the Mint, *Annual Reports*;

Bureau of Foreign and Domestic Commerce, *Commerce Year Books*; *Survey of Current Business*; *Statistical Abstracts of the United States*; *Commerce Reports*;

The Commercial and Financial Chronicle (New York);

The Economist (London).

Chapter I. Money and the Price System.

Jevons, W. S., *Money and the Mechanism of Exchange*, chaps. I, II and III, and Walker, F. A., *Money*, chap. I. These chapters are a useful summary of earlier views of the nature and functions of money.

Robertson, D. H., *Money*, chap. I. The advantages of money to the consumer and producer, and the effect of monetary instability on production and distribution are stated clearly and concisely.

Fisher, I., *The Money Illusion*, chap. I. The author indicates the persistence of the money illusion, even during periods of hyper-inflation.

Chapter II. Modern Forms of Money.

Marshall, A., *Money, Credit and Commerce*, Bk I, chap. V.

The most distinguished economist of recent times discusses briefly the nature of metallic money and the inadequacy of a monetary system "dependent on the hazards of mining."

Keynes, J. M., *A Treatise on Money*, vol. I, chap. 1. The classification of money is that commonly given in England. A brief section on the evolution of managed money is included.

Burns, A. R., *Money and Monetary Policy in Early Times*.

This is an interesting and informative account of the early history of money. A short essay by the same author is included in *London Essays in Economics: In Honour of Edwin Cannan*, edited by T. E. Gregory.

Laughlin, J. L., *A New Exposition of Money, Credit and Prices*, vol. I. The history of money in many countries, culminating in the almost universal adoption of the gold standard, is considered in this volume.

Chapter III. Gold and Other Monetary Standards.

Hawtrey, R. G., *The Gold Standard in Theory and Practice*. This small book contains a brief discussion of monetary standards, and a consideration of the advantages and disadvantages of the gold standard.

Gregory, T. E., *The Gold Standard and Its Future*, chaps. I, II and V. The author considers the gold standard in the light of current conditions. He is impressed by the advantages of a gold standard that functions satisfactorily.

Cole, G. D. H., *Gold, Credit and Employment*, I. The limitation upon successful monetary management is regarded as the basic objection to the gold standard.

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Walker, F. A., *International Bimetallism*. The advantages of the bimetallic standard are stated by its chief advocate, one of America's great economists.

Chapter IV. The Quantity of Money.

Robertson, D. H., *Money*, chap. III, parts I and II. The author indicates the dominant importance of reserves in determining the quantity of money.

Keynes, J. M., *A Treatise on Money*, vol. II, chaps. 24-26. Consideration is given to the relation of the quantity of deposit money to reserves, and to velocity as an aspect of the quantity of money.

Currie, L. B., *The Supply and Control of Money in the United States*, Part I, particularly chaps. II-IV. This is a good discussion of the quantity of money, a topic that has been neglected in recent monetary studies.

Chapter V. The Monetary System of the United States.

Dewey, D. R., *Financial History of the United States*. Thoro consideration is given to all factors affecting the monetary system, including not only coinage and note issues, but also banking, public finance and tariffs.

Hepburn, A. B., *History of Coinage and Currency in the United States*. The development of our monetary system is regarded as a struggle for sound money, a point of view familiarized by Bullock and Sumner.

Laughlin, J. L., *The History of Bimetallism in the United States*. This is a good study of the political and economic factors that led to the demonetization of silver. It contains useful statistical material on gold and silver coinage.

Chapter VI. Index Numbers of Prices.

Keynes, J. M., *A Treatise on Money*, vol. I, chaps. 4-8. The author's treatment of the meaning of index numbers of prices, and the diffusion of price levels is particularly valuable.

Marshall, A., *Money, Credit and Commerce*, Bk I, chaps. II and III, and Appendix B. The difficulties of constructing and interpreting index numbers of prices are presented in an informative and interesting manner.

Fisher, I., *The Making of Index Numbers*. The entire question of index numbers of prices—history, technique and interpretation—is considered at length in the best book on the subject.

King, W. I., *Index Numbers Elucidated*. Emphasis is placed on the use of index numbers for purposes other than determining the price level. Some of Fisher's conclusions are not accepted by King.

Chapter VII. Price Movements.

Layton, W. T., *An Introduction to the Study of Prices*. The movement of prices and its effects are briefly considered, with a preference expressed for slowly falling prices.

Mills, F. C., *The Behavior of Prices*, chap. IV. The frequency, amplitude and timing of price movements are analyzed.

Warren, G. F., and Pearson, F. A., *Prices*, chaps. XXII and V. These chapters contain a brief history of prices in the United States, and the authors' theory of the relation of gold to prices.

Chapter VIII. Theories of the Value of Money.

Mill, J. S., *Principles of Political Economy*, Bk III, chaps. VIII and IX. The cost of production and the supply and demand theories of the value of money are briefly considered.

Laughlin, J. L., *A New Exposition of Money, Credit and Prices*, vol. II, Part II. The author holds that "the value of any medium of exchange depends on its redemption in the standard gold," and that "the quantity of the medium of exchange is not a regulator of prices."

Ellis, H. S., *German Monetary Theory 1905-1933*, chaps.

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IV and V. The bullionist and supply and demand theories of the value of money are considered and rejected as inadequate explanations of the price level.

Chapter IX. The Equation of Exchange.

Greidanus, T., *The Value of Money*, chap. VI. The mechanical version of the quantity theory as stated by Fisher, Kemmerer, Cassel and others is considered.

Barker, D. A., *The Theory of Money*. The brief statement of the most rigid form of the quantity theory of money is much too one-sided to be satisfactory.

Lewinski, J. S., *Money, Credit and Prices*, chap. I. The author considers the implicit assumptions of the equation of exchange and comes to the conclusion that they are not in accord with reality.

Fisher, I., *The Purchasing Power of Money*. This is the best and most elaborate statement of the mechanical version of the quantity theory of money.

Chapter X. Cash Balances and the Price Level.

Greidanus, T., *The Value of Money*, chap. XII. The views of Marshall, Pigou, and others, on the relation of cash balances to prices are briefly considered.

Pigou, A. C., "The Value of Money," *Quarterly Journal of Economics*, Nov., 1917, reprinted in *Essays in Applied Economics*. The assumptions of the cash balances theory are stated and expressed in the form of an equation.

Keynes, J. M., *A Tract on Monetary Reform*, chap. III. This statement of his early views on the value of money is criticized by Keynes in *A Treatise on Money*, vol. I, chap. 14.

Cannan, E., *Money: Its Connexion with Rising and Falling Prices*, Part II. The community's desire to hold cash balances is regarded as the demand for money.

Chapter XI. Income and Expenditure and the Price Level.

Greidanus, T., *The Value of Money*, chap. XI. The con-

tinental writers who sought the explanation of the price level in income and expenditure are briefly considered.

Hawtrey, R. G., *Currency and Credit*, chap. IV. The influence of consumers' income and consumers' outlay on the price level is given great emphasis.

Keynes, J. M., *A Treatise on Money*, vol. I, chaps. 9-12. The author's fundamental monetary equations, emphasizing the importance of saving and investment, are elaborated in these chapters.

Martin, P. W., *Maintaining Purchasing Power*, Part II. Variations in prices are regarded as being due to changes in cost of production and to a superabundance or deficiency of purchasing power.

Chapter XII. The Discount Rate and the Price Level.

Wicksell, K., "The Influence of the Rate of Interest on Prices," *Economic Journal*, March, 1907. This is a brief statement of the relation of interest rates to prices by the most important expounder of the theory.

Cassel, G., *Money and Foreign Exchange after 1914*, pp. 101-137. The war-time rise in prices is explained as the result of insufficiently high discount rates.

Pigou, A. C., *The Theory of Unemployment*, Part IV, chaps. V-VII. The importance of equality of the prevailing and the proper rate of bank interest for economic equilibrium is considered fully.

Keynes, J. M., *A Treatise on Money*, vol. I, chap. 13. Emphasis is placed on the manner in which the discount rate may affect prices directly thru capitalization of the value of future uses of durable goods.

A note on the theories of the value of money.

Cole, G. D. H., *What Everybody Wants to Know about Money*, chap. VIII. The views of some unorthodox writers on money are considered briefly. Compare Foster, W. T., and Catchings, W. F., *Profits*, who hold

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that the monetary system as now organized must result in the distribution of insufficient purchasing power to consumers to buy the output of industry at stable prices.

Chapter XIII. Inflation and Deflation.

Harris, S. E., *Monetary Problems of the British Empire*, Part II, Bks IV and V. The process of inflation and deflation is shown from English monetary experience from 1914 to 1924.

Fisher, I., *The Money Illusion*, chaps. IV and V. The direct and indirect harm from inflation and deflation are briefly stated.

Keynes, J. M., *Essays in Persuasion*, Part II. This is a series of essays on inflation and deflation, including a chapter from *A Tract on Monetary Reform* on the evils of changing prices.

Chapter XIV. Commercial Banks and the Price Level.

Phillips, C. A., *Bank Credit*, chap. III. The possibility of credit expansion on the basis of excess reserves for one bank and for the banking system is considered. For the view denying that banks create credit, see Cannan, E., *Modern Currency*, pp. 88-103.

Currie, L. B., *The Supply and Control of Money in the United States*, chap. IV. The author states the objections to regulating the quantity of deposit money on the basis of the demand for bank loans.

Robertson, D. H., *Banking Policy and the Price Level*, chap. V. The distinction between forced and voluntary saving, and other important concepts are explained.

Chapter XV. The Central Bank and the Price Level.

Edie, L. D., *The Banks and Prosperity*, chaps. III, IV and VII. The objectives of central bank policy as they are and as they should be are discussed in an interesting manner.

Goldenweiser, E. A., *Federal Reserve System in Operation*, particularly chaps. IV and V. The structure and operations of the Reserve system are stated briefly.

Burgess, W. R., *The Reserve Banks and the Money Market*, particularly chaps. XI-XIII. This study of the relation of Federal Reserve policy to credit conditions is illustrated with numerous charts and tables.

Hardy, C. O., *Credit Policies of the Federal Reserve System*. The standards guiding the policies of the Reserve Banks are considered in this useful book.

Chapter XVI. Business Cycles.

Mitchell, W. C., *Business Cycles: The Problem and Its Setting*. The theoretical and statistical material on business cycles are given thoro consideration by the leading American authority on the question.

Pigou, A. C., *Industrial Fluctuations*. The causes and remedies of business cycles are considered by one of the great economists of our time.

Royal Institute of International Affairs, *Monetary Policy and the Depression*. This short study of the relation of money to depression is particularly useful for its excellent discussion of remedies for depression.

Hayek, F. A., *Monetary Theory and the Trade Cycle*, chap. III. The conclusion is reached that the explanation of business cycles must be largely monetary.

Chapter XVII. International Trade and Exchange.

Taussig, F. W., *International Trade*, particularly Part I on theory, and chaps. 26 and 27 on exchange. The difficult questions associated with dislocated exchanges are clarified by an eminent economist.

Harrod, R. F., *International Economics*, chaps. V, VII and IX. The discussions of the effects of abandoning gold and of imposing tariffs are particularly useful.

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- Cassel, G., *Money and Foreign Exchange after 1914*, pp. 137-186. The theory of purchasing power parity of foreign exchange is explained by its foremost advocate.
- Pigou, A. C., "The Foreign Exchanges," *Quarterly Journal of Economics*, Nov., 1922, reprinted in *Essays in Applied Economics*. The relation between prices and exchange rates is regarded as reciprocal rather than one-sided.

Chapter XVIII. Monetary Stabilization and Equilibrium.

- Hansen, A. H., *Economic Stabilization in an Unbalanced World*, chap. XIX. The various forms of stabilization of prices and incomes are briefly considered.
- Bradford, F. A., "Some Aspects of the Stable Money Question," *Quarterly Journal of Economics*, Aug., 1929. Consideration is given to the effect of different forms of stabilization on debtors and creditors.
- Keynes, J. M., *A Treatise on Money*, vol. I, chaps. 4 and 5. The retail, wholesale and international price levels, and the earnings of the factors of production are regarded as possible objects of a policy of stabilization.
- Pigou, A. C., *Industrial Fluctuations*, Part II, chap. III. The author holds that "in a stationary community the best arrangement would seem to be a price level stable in an absolute sense; but in a progressive one a price level stable about a falling trend."

Chapter XIX. Plans for Monetary Management.

- Pigou, A. C., *Industrial Fluctuations*, Part II, chaps. IV-X. Various plans for stabilization are considered briefly, and extended consideration is given to the possibility of stabilizing prices thru control of bank credit.
- Fisher, I., *Stabilizing the Dollar*, chap. IV and Appendix II. The plan for the compensated dollar and some criticisms are discussed briefly.

Keynes, J. M., *A Treatise on Money*, vol. II, Bk VII. Thoro consideration is given to the problems of national and international management of money by the leading advocate of monetary management.

Lawrence, J. S., *Stabilization of Prices*. A large number of plans for monetary management are considered and rejected on the ground that they are likely to be ineffective and undesirable if effective.

Chapter XX. A Monetary Program.

Cole, G. D. H., *What Everybody Wants to Know about Money*, chaps. XI and XII. The author favors thoro-going control of the monetary system, including the socialization of banking and investment.

Currie, L. B., *The Supply and Control of Money in the United States*, Part III. Various suggestions for increasing the effectiveness of control of the monetary system of this country are given critical consideration.

Lombard, N., *Monetary Statesmanship*, Part IV. Recommendations are made for monetary management thru legislative and administrative control to be supplemented by research and education.

Edie, L. D., *Dollars*. The future of the American monetary system is discussed, and the conclusion is reached that a return to a reconstructed gold standard is desirable.

Glossary

- Appreciation of money.** A rise in the purchasing power of money; a fall in prices.
- Auxiliary silver reserve.** A reserve of silver held in gold standard countries to supplement the gold reserve. The policy of the United States is to hold a silver reserve equal to one-third of the gold reserve.
- Balance of international payments.** The reciprocal claims of nationals and governments of different countries against each other arising from international trade and finance; the difference between the totals of these claims. See *proper balance of international payments*.
- Bank credit.** The loans and investments of commercial banks; deposit money.
- Bank rate.** In England, the rate charged by the Bank of England on its advances; the discount rate.
- γ
x **Bimetallism.** A monetary system with free coinage of gold and silver at a fixed ratio. Under bimetallism a difference in the mint and market ratios of the value of gold and silver may lead to the complete displacement of one metal from the monetary system. For this reason a bimetallic standard is occasionally called an alternate standard of gold or silver. Cf. *symmetallism*.
- x **Bullionism.** The theory that the value of money is determined by the value of the money metal for which it is or will be redeemed.
- Business earnings.** That net income of business men that would induce them to maintain the prevailing volume of employment. This would require net current investment equal to current savings. Unless business earnings are equal to normal business earnings, the factors of production will not be fully employed. See *normal business earnings*.
- Capital good.** A good used in further production to obtain the income attributable to the contribution of that good to the process of production.
- Capital market.** The long term loan market; the supply of and demand for long term loans.
- Capitalization.** The determination of the present value of a durable good or property by discounting the future incomes it will yield.
- Coin.** Money made of metal bearing the government's mark indicating its nominal value. If the market value of the metal is equal to the nominal value of the coin, it is full-bodied, commodity money; otherwise it is token money.

Fractional coins. Coins for less than a unit of money; in the United States all coins for less than a dollar. Generally, fractional coins are token money.

✓ **Minor coins.** In the United States, one cent and five-cent coins.

✓ **Subsidiary silver coins.** In the United States, all silver coins of less than a dollar.

Token coins. Coins with a nominal value exceeding the commodity value of their metallic content. In the United States, all coins are token coins.

Compensated dollar. See *gold value standard*.

Consumers' income. See *income*.

Consumers' outlay. Expenditure of consumers on consumption and investment.

Consumption goods. Goods or services purchased for final use—that is, not for use in further production or for reselling.

Cost of production. The expenses of production; the total expenses of production or the expenses of production for a unit of output.

Real cost of production. The sacrifices incurred in the course of production; the quantity of labor, waiting, risk and management used in production.

Credit. See *bank credit*.

Deflation. A fall in prices relative to expenses, so that the net income of business men is less than normal business earnings, and the demand for the factors of production is insufficient to provide full employment.

Absolute deflation. A fall in prices, expenses not falling as much as prices.

Relative deflation. A rise in expenses, prices not rising as much as expenses.

Demonetization. A termination of the right of free coinage, as in the demonetization of silver.

Deposit. Funds credited to the account of a person or firm at a commercial bank that may be withdrawn on demand by check.

Additional-primary-deposit. A deposit that increases the reserves of the bank in which it is made and the total reserves of the banking system; e.g., a deposit of lawful money.

Loan-deposit. A deposit in a bank that has its origin in a loan made by that bank. When withdrawn loan-deposits become transfer-primary-deposits in other banks.

Transfer-primary-deposit. A deposit that increases the reserves of the bank in which it is made, but decreases the reserves of other banks; e.g., a deposit of checks drawn on other banks.

Depreciation, foreign exchange. A fall in the exchange value of a money in terms of foreign currencies.

- Depreciation of money.** A fall in the purchasing power of money; a rise in prices.
- Devaluation.** A decrease in the quantity of the money commodity in a unit of money.
- Discount rate.** The rate charged by commercial banks for short period loans. See *proper discount rate*.
- Distribution of the national income.** See *functions of money*.
- Efficiency of gold.** The ratio of the total quantity of money of all kinds to the quantity of monetary gold.
- Elastic demand.** A small change in the price of a good brings about a more than proportionate change in the quantity purchased.
- Equilibrium.** An equality of complementary forces, such as supply and demand, prices and expenses, savings and investment.
- Economic equilibrium.** The conditions under which prices are equal to the expenses of production, and business men are induced to offer full but not excessive employment to the factors of production.
- External equilibrium.** The conditions under which the balance on international payments induces neither inflation nor deflation. See *proper balance of international payments*.
- Equilibrium price or rate.** The price or rate at which the quantity demanded of a good or factor of production equals the quantity supplied.
- Exchange restrictions.** Control of the demand for foreign exchange to maintain the foreign exchange value of a currency; a device for limiting imports.
- Expenditure.** The use of money in purchasing consumption goods; for some purposes also the use of money in purchasing investment goods.
- Expense level.** The price level of raw materials and the factors of production.
- Expenses of production.** See *cost of production*.
- Factors of production.** The labor, capital goods, natural resources and business management used jointly in producing the national income.
- Fiduciary issue.** In England, that part of the issue of Bank of England notes in excess of the gold reserve.
- Free coinage.** The right to have a commodity coined into money for private account. Under a gold standard, there is free coinage of gold; under bimetallism, free coinage of gold and silver.
- Free enterprise.** An economic system in which the right to engage in economic activity is open to everyone on an equal legal basis; and in which few restrictions are placed on economic activity if they are not definitely anti-social, so that economic activity is generally undertaken by people because it serves their ends. See *price system*.
- Free standard.** A monetary system not based on a money commodity or on foreign exchange. See *managed standard*.

Functions of money. The proper production of the national income—that is, a large volume of production of the goods most desired in the community; the proper distribution of the national income—that is, the division of the national income among the factors of production in accordance with their economic worth, so that there is an inducement to employ fully the available factors of production; and the utilization of the national income in consumption and in investment to provide for the present needs and the economic progress of the community.

Gold. Monetary gold consists of gold coins in circulation, and gold reserves of coin, bullion and foreign exchange on gold standard countries.

Gold payment; specie payments. The sale of gold by a government or central bank at a fixed or nearly fixed price in lawful money.

× **Gold standard.** A monetary system in which the quantity and value of money are ultimately limited by the supply of gold.

× **Gold bullion standard.** A monetary system in which lawful money is redeemed in gold bars, generally of about 400 fine ounces.

Gold coin standard. A monetary system in which lawful money is redeemed in gold coin.

× **Gold exchange standard.** A monetary system in which lawful money is redeemed in bills of exchange on gold standard countries.

× **Gold value standard.** A monetary system in which lawful money would be redeemable in a varying quantity of gold of constant purchasing power.

× **Limping gold standard.** A monetary system in which silver coins of large denomination have unlimited legal tender power, altho lawful money is redeemable in gold.

× **Gresham's law.** The tendency for one type of money, gold or silver, to predominate in bimetallic countries; the tendency of depreciated paper money to displace gold coin in countries that abandon the gold standard.

Import quota. A regulation limiting the import of certain goods to stated amounts or values in a period of time. See *tariff*.

Income. The total of individual money incomes of a community; the money value of the production of a community in a period of time.

Real income. The net additional goods and services produced by a community in a period of time, allowance being made for raw materials and depreciation of capital goods used in production; the purchasing power of money income.

Income-earning assets. Assets that yield a money income; e.g., loans and investments of commercial banks, rediscounts and securities of central banks. Reserves of lawful money or gold are not income-earning assets.

Index numbers of prices. The average percentage ratio of prices of a collec-

tion of goods and services at one time or place and the prices of the same collection at another time or place; an indication of the relative value of money.

Inelastic demand. A small change in the price of a good brings about a less than proportionate change in the quantity purchased.

Inflation. A rise in prices relative to expenses, so that the net income of business men is more than normal business earnings, and the demand for the factors of production provides excessive employment.

Absolute inflation. A rise in prices, expenses not rising as much as prices.

Credit inflation. A rise in prices relative to expenses that results from an increase in the quantity of bank credit.

Gold inflation. A rise in prices relative to expenses that results from an increase in the quantity of monetary gold.

Relative inflation. A fall in expenses, prices not falling as much as expenses.

Interest. The money payment additional to the principal amount of a loan; the rate at which money is lent on long period loan. See *discount rate*.

Natural interest rate. The rate that would be charged if real resources were lent without the intervention of money. Cf. *real interest rate*.

Negative interest. A premium paid by a lender to a borrower; a rate of interest requiring repayment of a smaller amount of money or purchasing power than is lent.

Normal interest rate. As used by Cassel and Wicksell, the rate of interest that equates the volume of savings and loans; the rate of interest that would stabilize prices. Cf. *proper discount rate*.

Real interest. The purchasing power of interest; the ratio of the purchasing power of interest and the purchasing power of the principal at the time a loan was made.

International standard. A monetary standard used in many countries, as gold; a standard that brings about similar price movements in many countries; the proposal to stabilize the price level of goods that enter into international trade; a standard that limits variations in rates of exchange.

Investment. Expenditure on goods or services for use in further production or for reselling.

Current investment. The total expenditure of business men on current production.

Negative investment. Withdrawal of goods from investment thru non-replacement of depreciated capital goods, or thru sale of investment goods without reinvestment of the proceeds of the sale.

Net current investment. The amount by which the current investment of business men exceeds the total cost of producing the goods currently sold for consumption.

- Investment goods.** Goods purchased or produced for use in further production or for reselling.
- Legal tender.** Money that must be accepted in payment of a debt. In the United States, all lawful money.
- Managed money.** Money that secures its value from management of its supply; specifically, lawful money and deposit money; the money of a country not on a gold standard.
- Managed standard.** A monetary system in which money is managed with the object of maintaining economic equilibrium or of stabilizing prices.
- Market ratio.** The ratio of the value of gold and silver in the bullion markets of a country. See *bimetallism*.
- Member banks.** Commercial banks in the Federal Reserve system.
- Mint par of exchange.** The ratio of the fine metallic content of the unit coins of two countries on the same metallic standard.
- Mint price of gold.** The price at which a mint or central bank must buy gold.
- Mint ratio.** The ratio of the value of gold and silver at the mint or central bank of a country on a bimetallic standard. See *bimetallism*.
- Monetary standard.** The commodity that determines or limits the supply and value of money, as gold in gold standard countries; the object with which the monetary system of a country is managed. Cf. *managed standard*.
- Money.** Anything used as an economic unit of measurement and generally accepted in payment for goods and services and in discharge of business obligations.
- × **Commodity money.** Money coined on a quantity of metal equal in value to the nominal value of the coin; gold coins in gold standard countries.
- Deposit money.** Demand deposits of commercial banks used as money by drawing checks.
- × **Fiat money.** Lawful money not redeemable in gold or silver; inconvertible paper money.
- Government money.** Lawful money issued directly by government, as United States notes, silver dollars and certificates, and fractional coins.
- Lawful money.** All money including notes and coins issued by government or by authority granted by government.
- × **Representative money.** Money secured by deposit of gold or silver to the full nominal value of the representatives.
- Money commodity.** A commodity used for monetary and industrial purposes, such as gold or silver.
- Money illusion.** The common attitude that the value of money is constant; the view that money rates of wages and nominal interest rates are a full measure of the well-being of workers and security holders.

* *Money market.* The short term loan market; the call money market; the supply of and demand for short term loans.

Money metal. Gold or silver.

* *Monometallism.* A monetary system in which the value of money is determined or limited by one metal, gold or silver. Cf. *bimetallism*, *symmetallism*.

* *Multiple standard.* A monetary system in which money contracts are payable in a variable amount of money of constant purchasing power; a managed monetary system with stable prices. See *managed standard*.

National income. See *income*.

National standard. A monetary standard that permits the price level of a country to remain independent of the price levels of other countries; a monetary system in which exchange rates vary. See *managed standard*.

Normal business earnings. That net income of business men that would bring about full employment of the factors of production. When the net income of business men exceeds normal business earnings there is an excessive demand for the factors of production. When the net income of business men is less than normal business earnings there is insufficient demand for the factors of production.

* *Open market operations.* The purchase or sale of securities by a central bank to increase or decrease bank reserves.

Output. Goods and services of all kinds produced in a period of time.

Penalty rate. A rediscount rate sufficiently high to make borrowing from a central bank for the purpose of relending unprofitable.

Price level. The average level of prices of goods and services of various kinds.

General price level. The average level of prices of all kinds, including retail and wholesale prices, wages, rents and security prices.

Industrial price level. The wholesale price level of industrial goods; probably the best price level for stabilization in the United States.

International price level. The wholesale price level of goods entering into international trade.

Retail price level. The price level of goods and services purchased for consumption.

Wholesale price level. The price level of goods purchased for investment.

Price system. An economic system in which economic activity is undertaken with reference to prices and profits. See *free enterprise*.

Production of the national income. See *functions of money*.

Productive resources. See *factors of production*.

Profits. The net income of business men in excess of business earnings; the motivating force for undertaking production by business men.

Deflationary profits. The amount by which the net income of business men falls short of normal business earnings; the cause of an insufficient volume of employment.

Inflationary profits. The amount by which the net income of business men exceeds normal business earnings; the cause of an excessive volume of employment.

Proper balance of international payments. In gold standard countries, the balance that results in sufficient import (or export) of gold to provide for industrial and monetary needs; the balance that does not disturb economic equilibrium.

Proper discount rate. A rate that brings about sufficient investment to maintain full but not excessive employment of the factors of production.

Purchasing power of money. The value of money; the quantity of goods for consumption that can be purchased with money; the inverse of the price level.

Purchasing power parity. The rate of foreign exchange that corresponds to the ratio of the purchasing power of money in two countries.

Rates of remuneration. The money payments to the factors of production. The rates of remuneration largely determine the expense level of business men.

Efficiency rates of remuneration. Real or money rates of remuneration on the basis of output; piece rates.

Effort rates of remuneration. Real or money rates of remuneration on the basis of effort; time rates.

Real rates of remuneration. The purchasing power of the payments to the factors of production. When real rates of remuneration, including normal business earnings, for a unit of output exceed a unit of output, business men incur losses, and there is insufficient employment; when real rates of remuneration for a unit of output are less than a unit of output, business men have inflationary profits, and the volume of employment is excessive.

Real resources. The economic goods and services purchased with money.

Rediscount rate. The rate at which a central bank makes advances to member banks. See *penalty rate*.

Rediscounting. The process by which a central bank makes advances to member banks.

Remunerative price level. The price level at which the net income of business men equals normal business earnings; the price level that maintains economic equilibrium.

Reserve ratio. The ratio of reserves to obligations required by law. The reserve ratio on Federal Reserve notes is 40 per cent in gold reserve notes; on Federal Reserve deposits, 35 per cent in gold reserve notes or government money. The reserve ratio on demand deposits of

member banks is 13 per cent in New York and Chicago, 10 per cent in certain large (reserve) cities, and 7 per cent in other places, the reserves to be deposited with the Federal Reserve Banks.

Reserves, bank. Lawful money and deposits with a central bank held by commercial banks determined with reference to deposit liabilities.

Borrowed reserves. Reserves acquired by commercial banks by borrowing from a central bank.

Excess reserves. Lawful money and deposits with a central bank in excess of the requirements of commercial banks.

Free reserves. Gold reserves of a central bank or government in excess of the minimum legal requirement.

× *Gold reserves.* Coin, bullion and exchange on gold standard countries held by a central bank or government as a reserve for the issue of lawful money and the reserve deposits of member banks.

Legal reserves. Reserves of lawful money and deposits with a central bank required by law for all commercial banks; reserves of gold required by law for a central bank or government.

Savings. That part of the money income of a community not spent in purchasing consumption goods.

× *Abortive savings.* The amount by which the savings of the community exceed investment. Because of the fall in prices, consumption is not diminished despite savings.

Forced savings. The amount by which the investment of the community exceeds savings. Because of the rise in prices, consumption is diminished, altho the community has not voluntarily saved. The excessive extension of bank loans is the chief cause of forced savings.

Negative savings. Expenditure on consumption in excess of income; e.g., by means of credit sales, consumption loans, doles, etc.

× *Seigniorage.* A charge by government for coining a commodity into money; the difference between the nominal and commodity value of a token coin.

× *Standard money.* That money into which all other types are convertible; in gold standard countries, gold coins; under a limping gold standard, also certain types of silver coin. See *monetary standard*.

× *Symmetallism.* A plan proposed by Marshall to make a unit of money redeemable in a given quantity of gold and a given quantity of silver. Cf. *bimetallism*.

Tabular standard. See *multiple standard*.

Tariff. A tax on the import of goods that has the effect of diminishing purchases of goods produced abroad.

Utilization of the national income. See *functions of money*.

Value of money. See *purchasing power of money*.

Velocity of money. The average number of times a unit of money is used in making payments of all kinds in the course of a year.

Income velocity of money. The average number of times a unit of money is used in paying income in the course of a year.

Yield of capital. Money income received from an investment in a capital good; the percentage ratio of the money income and the price of a capital good.

Real yield of capital. That part of the joint output of the factors of production that may be attributed to a capital good; the purchasing power of the yield of capital.

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